DOCUMENT RESUME

ED 143 669 95 TM 006 050

AUTHOR	Yarborough, Betty H.; And Others
TITLE	A Study of the Relative Effectiveness of Non-Graded and Graded Instruction in the First Six Years of Elementary Schooling. Final Report.
INSTITUTION	Old Dominion Univ., Norfolk, Va.
SPONS AGENCY	National Inst. of Education (DHEW), Washington, D.C. Office of Research Grants.
PUB DATE	31 Aug 76
GRANT	NEG-00-3-0195
NOTE	134p.; Pages 119 through 121 of the original document, Something About Myself, are copyrighted and therefore not available. They are not included in the pagination
AVAILABLE FROM	Appendix H, Something About Myself, is available from Stoelting Company, 1350 South Kostner Avenue, Chicago, Illinois 60623
EDRS PRICE	MF-$0.83 HC-$7.35 Plus Postage.
DESCRIPTORS	Affective Behavior; Affective Tests; Cognitive Processes; Cognitive Tests; *Comparative Analysis; Elementary Education; Grade 7; Intelligence Differences; Junior High Schools; Longitudinal Studies; Nongraded System; Personality Tests; *Program Effectiveness; Self Concept; Self Esteem; *Traditional Schools; *Ungraded Elementary Programs; *Ungraded Schools
IDENTIFIERS	Chesapeake Public Schools VA; Virginia (Chesapeake)

ABSTRACT

An experimental group of 51 students from non-graded and three matched groups of 187 pupils from graded programs were studied to determine the relative effectiveness of non-graded and graded approaches to elementary education and whether any differences found at the end of six years of schooling remained after both groups had been exposed to a full year in the seventh grade of traditional junior high schools. Data from batteries of cognitive and affective tests measuring 31 variables revealed few differences between graded and ungraded groups. (Author/GDC)

****
* Documents acquired by ERIC include many informal unpublished *
* materials not available from other sources. ERIC makes every effort *
* to obtain the best copy available. Nevertheless, items of marginal *
* reproducibility are often encountered and this affects the quality *
* of the microfiche and hardcopy reproductions ERIC makes available *
* via the ERIC Document Reproduction Service (EDRS). EDRS is not *
* responsible for the quality of the original document. Reproductions *
* supplied by EDRS are the best that can be made from the original. *
****

ED143669

U S DEPARTMENT OF HEALTH
EDUCATION & WELFARE
NATIONAL INSTITUTE OF
EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY

FINAL REPORT

PROJECT NO. 3-2724
GRANT NO. NEG-00-3-0195

A STUDY OF THE RELATIVE EFFECTIVENESS OF NON-GRADED AND GRADED INSTRUCTION IN THE FIRST SIX YEARS OF ELEMENTARY SCHOOLING

BETTY H. YARBOROUGH
OLD DOMINION UNIVERSITY
NORFOLK, VIRGINIA 23508

ROGER A. JOHNSON
OLD DOMINION UNIVERSITY
NORFOLK, VIRGINIA 23508

E. MURRAY RUDISILL
OLD DOMINION UNIVERSITY
NORFOLK, VIRGINIA 23508

JENNIE WALSH
REGION II MENTAL HEALTH CENTER
OXFORD, MISSISSIPPI 38655

AUGUST 31, 1976

The research reported herein was performed pursuant to a grant with the National Institute of Education, U. S. Department of Health, Education, and Welfare. Contractors undertaking such projects under Government sponsorship are encouraged to express freely their professional judgment in the conduct of the project. Points of view or opinions stated do not, therefore, necessarily represent official National Institute of Education position or policy.

U.S. DEPARTMENT OF

HEALTH, EDUCATION, AND WELFARE

NATIONAL INSTITUTE OF EDUCATION

OFFICE OF RESEARCH GRANTS

TM006 050

Abstract

This study has compared an experimental group of 51 non-graded pupils with three control groups of graded pupils: Control Group A (n=46), selected by man-to-man matching procedures; Control Group B (n=100), selected by stratified-random-sampling procedures; and Control Group C (n=41), selected according to similarity of community and school background. All pupils, experimental and control, had attended the Chesapeake, Virginia, public schools for six years; were 12 years old; and, upon entering the seventh grade, were rendered a battery of cognitive and affective tests totaling 31 variables. This same battery of tests was repeated at the end of the seventh grade, with the addition of eight variables.

The data gathered allowed the investigators to determine the relative effectiveness of non-graded and graded approaches to elementary schooling and to determine whether any differences found at the end of six years of schooling remained after both non-graded and graded pupils had been exposed to a full year in the seventh grade of traditional junior high schools.

The study revealed few differences between non-graded and graded pupils. Non-graded pupils evidenced some slight advantage among the cognitive variables but were somewhat less advantaged among the affective variables. Analysis of variance procedures revealed several significant interaction effects between IQ levels and treatment groups. It appears that less able pupils profited more affectively in the non-graded environment, while brighter pupils profited more affectively in the graded environment.

Furthermore, the data indicate that both non-graded and graded pupils experienced significant attenuation of scores on several affective measures from the fall to the spring testing. The seventh grade in traditional junior high schools appears to have had a somewhat deleterious effect upon the self-confidence and the attitudes of all pupils in this study.

FINAL REPORT

PROJECT NO. 3-2724
GRANT NO. NEG-00-3-0195

A STUDY OF THE RELATIVE EFFECTIVENESS OF NON-GRADED AND GRADED INSTRUCTION IN THE FIRST SIX YEARS OF ELEMENTARY SCHOOLING

BETTY H. YARBOROUGH
OLD DOMINION UNIVERSITY
NORFOLK, VIRGINIA 23508

ROGER A. JOHNSON
OLD DOMINION UNIVERSITY
NORFOLK, VIRGINIA 23508

E. MURRAY RUDISILL
OLD DOMINION UNIVERSITY
NORFOLK, VIRGINIA 23508

JENNIE WALSH
REGION II MENTAL HEALTH CENTER
OXFORD, MISSISSIPPI 38655

AUGUST 31, 1976

The research reported herein was performed pursuant to a grant with the National Institute of Education, U. S. Department of Health, Education, and Welfare. Contractors undertaking such projects under Government sponsorship are encouraged to express freely their professional judgment in the conduct of the project. Points of view or opinions stated do not, therefore, necessarily represent official National Institute of Education position or policy.

U.S. DEPARTMENT OF

HEALTH, EDUCATION, AND WELFARE

NATIONAL INSTITUTE OF EDUCATION

OFFICE OF RESEARCH GRANTS

Preface

The original design proposed for this study was relatively simple. It was planned that an experimental group of non-graded pupils would be compared with a matched-pairs group of control pupils and that *t*- test comparisons of several cognitive and affective variables would be made. Since the experimental pupils in this study were a very select group of pupils who had attended a non-graded school for six years and research evidence as to the efficacy of non-graded elementary schools was meager, the National Institute of Education asked the investigators to expand the study to the extent possible and to "massage" the data to the degree feasible.

The design that emerged is both comprehensive and complex. Considerable expenditures of the time and energies of many persons have been necessary to execute the study, begun in August, 1973, and completed in August, 1976.

Dr. Jennie Walsh encouraged the principal investigator to initiate the study. She worked diligently in the preparation of the proposal and in the gathering of the data. Although Dr. Walsh relocated in another state at the end of the first year of the study and was thereafter limited as to her association with the project, her contributions were invaluable and are deeply appreciated by the principal investigator.

Dr. Murray Rudisill, like Dr. Walsh, assisted with the preparation of the proposal. He also assisted with the collection of the data and with the initial efforts to process the data. Unfortunately, he was not able to participate in the final analysis and interpretation of the data and in the preparation of this report because of other commitments. His many contributions, however, are sincerely appreciated by the principal investigator.

The principal investigator also wishes to express special appreciation to Dr. Roger Johnson for his contributions to this project. Without his assistance, the processing and interpreting of the data as well as the preparation of this report could hardly have been completed since two other members of the research team were not able to continue in their original roles. Dr. Johnson was also the member of the team who assumed primary responsibility for reviewing the related literature.

Mrs. Carol Raper was originally assigned to this project as a graduate assistant. She remained in that role for two years, after which time she joined the faculty of Old Dominion University and continued to make outstanding contributions to the research project. Mrs. Raper's diligent assistance throughout the course of the project is appreciated by each member of the research team.

The research team also wishes to express appreciation to Dr. Claude McHenry of the Department of Mathematics and Computer Sciences of Old Dominion University for his advice as to statistical techniques and computer programs which yielded the results that constitute the body of this report.

Dr. Edward Cross, of the Department of Management Information Systems of Old Dominion University, also assisted the researchers with the selection of statistical procedures for analysis of the data. The investigators are appreciative of his efforts.

Mr. Carl Russ, Director of the Old Dominion University Computer Center, made the computer facilities of Old Dominion University available to the extent possible and assisted the investigators in finding other sources for computer services when it was realized that the computer programs planned for this study could not be processed by a new computer installed at the end of the second year of this study.

Mr. Gregory Neary, like Mrs. Raper, was a graduate assistant to this project. His efforts during the year of data collection were extremely important. Mrs. Jane Capshaw and Miss Roberta Walker assisted the investigators with the review of the related literature. The research team expresses their appreciation for the efforts of each of these students.

Consultants to this project included three members of the staff of Education Testing Service: Dr. Fred McDonald, Dr. Thomas Hilton, and Mr. Robert Cleary. The advice of these consultants assisted the investigators in the gathering of the data and in the mapping of the overall design of the study.

Dr. Richard Brandt, Dean, School of Education, University of Virginia, advised the investigators as to the selection of instruments for measuring certain affective behaviors. The research team is grateful for Dr. Brandt's assistance and support during the course of the study.

The investigators are extremely grateful for the assistance of Miss Thelma Mountcastle, Mrs. Janie Bryce, and Mrs. Nancy Willoughby, who assumed primary responsibility for the typing of the final report. Miss Mountcastle also assisted in preparing the data for processing and in preparing tables for the report. Her efforts throughout the entire course of the project have been extremely valuable.

Mrs. Sara Jane Barrett, Mrs. Penny Brangan, Mrs. Helen Hylton, Mrs. Brenda Jackson, Mrs. April Jenkins, Mrs. Beverly Oliver, Mr. Charles Parker, Miss Elizabeth Raper, Miss Margaret Riggins, Mrs. Sara Riddsill, Mrs. Barbara Sloan, Miss Janet Unser, Mrs. Donna Urbanyi, Mrs. Diane Wall, and many others provided services, such as administering and scoring tests, gathering demographic data, typing, etc., during the various phases of the project.

The principal investigator wishes particularly to express

appreciation to Dr. Richard Otte of the National Institute of Education for his tolerance and understanding when computer difficulties delayed the processing of the data and the preparation of this report. She also wishes to thank Mr. Clifford Adams, Dr. Ralph Boyers, and other members of the staff of the Old Dominion University Research Foundation, whose support and advice have been invaluable during the proposal, implementation, analysis, and report phases of this study.

The principal investigator has made every effort to be worthy of the assistance and encouragement of all who have helped her in this very demanding research undertaking. She hopes that the resulting study will contribute substantially to existing understanding of both the values and the limitations of non-graded schooling.

Betty H. Yarborough, Ed. D.
Professor of Education
Old Dominion University
Principal Investigator
August, 1976

Table of Contents

Preface 3

List of Tables 8

Introduction 10

- Purpose of the Study 10
- Setting of the Study 10
- Review of Related Literature 11
- Limitations of the Study 12
- Hypotheses 13

Method 19

- Subjects 19
  - Experimental Group 19
  - Control Groups 20
- Design 29

Results 31

- Experimental Group vs. Control Group A 31
  - Fall testing 31
  - Spring testing 31
- Experimental Group vs. Control Group B 34
  - Fall testing 34
  - Spring testing 37
- Experimental Group vs. Control Group C 41
  - Fall testing 41
  - Spring testing 44
- Fall-Spring Gains by Groups 49
  - Experimental Group vs. Control Groups A,B,C, fall-spring 49
  - Experimental Group, fall-spring 49
  - Control Group A, fall-spring 53
  - Control Group B, fall-spring 53
  - Control Group C, fall-spring 53

Findings by Hypotheses 64

- Main Effects, Fall, E(A,B,C) 64
- Interaction Effects, Socio-Economic Levels, Fall, E(A,B,C) 64
- Interaction Effects, Intelligence Levels, Fall, E(A,B,C) 65

Main Effects, Spring, E(A,B,C)..... 65
Main Effects, Additional Variables, Spring, E(A,B,C)..... 65
Interaction Effects, Socio-Economic Levels, Spring, E(A,B,C)... 65
Interaction Effects, Intelligence Levels, Spring, E(A,B,C)..... 66
Main Effects, Fall-Spring Gain Scores, E(A,B,C)..... 66
Interaction Effects, Fall-Spring Gain Scores, Socio-Economic Levels, E(A,B,C)..... 66
Interaction Effects, Fall-Spring Gain Scores, Intelligence Levels, E(A,B,C)..... 66
Main Effects, Fall-Spring Gain Scores, F (E)..... 67
Main Effects, Fall-Spring Gain Scores, A (A)..... 67
Main Effects, Fall-Spring Gain Scores, B (B)..... 67
Main Effects, Fall-Spring Gain Scores, C (C)..... 68

Conclusions..... 69

Discussion..... 71

Recommendations..... 73

Bibliography..... 74

References..... 74
Professional Resources..... 76
Tests..... 77

Appendixes..... 78

A. The Chesapeake Demonstration School..... 78
B. The Chesapeake, Virginia, Graded Elementary Schools..... 81
C. The Chesapeake, Virginia, Junior High Schools..... 83
D. Analysis of Related Literature..... 84
E. The City of Chesapeake, Virginia..... 98
F. Nowicki-Strickland Scale..... 100
G. Semantic Differential..... 104
H. Something About Myself..... 119
I. Cognitive Tests and Affective Tests..... 122
J. Numbers of the Hypotheses Related to Each Variable..... 124
K. Summary of Significant Main Effects and Significant Interactions Among Treatment Groups, Intelligence Levels, and Socio-Economic Levels for Experimental Group vs. Control Groups A,B, and C--Fall and Spring Testing..... 126
L. Summary of Significant Gain Scores Between Fall and Spring Testing for the Experimental Group and Control Groups A,B, and C..... 131

List of Tables

Table		Page
1.	Pupils Who Left Chesapeake Demonstration School, 1967-73, from the Six-Year-Old Class of 1967	21
2.	Pupils Participating in Fall, 1973, Testing by Group and School	25
3.	Pupils Participating in Spring, 1974, Testing by Group and School	26
4.	Means, Standard Deviations, and Observed Values of F for Significant Main Effects and Observed Values of F for Significant Interaction Among Treatment Groups, Intelligence Levels, and Socio-Economic Levels for Experimental Group vs. Control Group A--Fall Testing	32
5.	Means, Standard Deviations, and Observed Values of F for Significant Main Effects and Observed Values of F for Significant Interaction Among Treatment Groups, Intelligence Levels, and Socio-Economic Levels for Experimental Group vs. Control Group A--Spring Testing	33
6.	Means, Standard Deviations, and Observed Values of F for Significant Main Effects for Experimental Group vs. Control Group B--Fall Testing	35
7.	Observed Values of F for Significant Interactions Among Treatment Groups, Intelligence Levels, and Socio-Economic Levels for Experimental Group vs. Control Group B--Fall Testing	36
8.	Means, Standard Deviations, and Observed Values of F for Significant Main Effects for Experimental Group vs. Control Group B--Spring Testing	38
9.	Observed Values of F for Significant Interactions Among Treatment Groups, Intelligence Levels, and Socio-Economic Levels for Experimental Group vs. Control Group B--Spring Testing	39

10. Means, Standard Deviations, and Observed Values of F for Significant Main Effects for Experimental Group vs. Control Group C--Fall Testing..... 42

11. Observed Values of F for Significant Interactions Among Treatment Groups, Intelligence Levels, and Socio-Economic Levels for Experimental Group vs. Control Group C--Fall Testing..... 43

12. Means, Standard Deviations, and Observed Values of F for Significant Main Effects for Experimental Group vs. Control Group C--Spring Testing..... 45

13. Observed Values of F for Significant Interactions Among Treatment Groups, Intelligence Levels, and Socio-Economic Levels for Experimental Group vs. Control Group C--Spring Testing..... 46

14. Means and Observed Values of F for Gain Scores Between Fall and Spring Testing for the Experimental Group--Cognitive Variables..... 50

15. Means and Observed Values of F for Gain Scores Between Fall and Spring Testing for the Experimental Group--Affective Variables..... 51

16. Means and Observed Values of F for Gain Scores Between Fall and Spring Testing for the Control Group A--Cognitive Variables..... 55

17. Means and Observed Values of F for Gain Scores Between Fall and Spring Testing for the Control Group A--Affective Variables..... 56

18. Means and Observed Values of F for Gain Scores Between Fall and Spring Testing for the Control Group B--Cognitive Variables..... 58

19. Means and Observed Values of F for Gain Scores Between Fall and Spring Testing for the Control Group B--Affective Variables..... 59

20. Means and Observed Values of F for Gain Scores Between Fall and Spring Testing for the Control Group C--Cognitive Variables..... 61

21. Means and Observed Values of F for Gain Scores Between Fall and Spring Testing for the Control Group C--Affective Variables..... 62

Introduction

Over the last two decades professional educators have evidenced considerable interest in non-graded procedures as a means of maximizing both the cognitive and affective development of elementary pupils. The current professional literature includes a number of articles and books on various aspects of non-graded schooling and related subjects, such as individualized instruction, open schooling, and the like. Much of the existing literature as to the efficacy of both the theory and practice of non-graded procedures is subjective, however. Research in which the effectiveness of non-graded schooling has been studied is generally lacking. This research study was conducted to provide additional objective data, scientifically gathered and analyzed, to expand the existing resources to which educators can refer for more in-depth appraisal of non-gradedness as a form of elementary schooling.

Purpose of the Study

The primary purpose of this study was to determine the relative effectiveness of a non-graded approach to elementary schooling by comparing the cognitive development and affective development of certain pupils who had had six years of non-graded schooling with those of pupils who had had six years of traditional graded schooling.

A second purpose of the study was to determine whether any differences found at the end of six years of schooling remained after both the non-graded and graded pupils had been exposed to a full year in the seventh grade of a traditional junior high school.

Setting of the Study

The non-graded or Experimental subjects in this study attended the Chesapeake Demonstration School in Chesapeake, Virginia. Three control groups were selected from among the 21 graded elementary schools in Chesapeake. Each Experimental and Control subject attended the seventh grade in one of the six traditional junior high schools in Chesapeake. Appendix A includes a detailed description of the Chesapeake Demonstration School; Appendix B, a description of the graded elementary program found in 21 elementary schools in Chesapeake; and Appendix C, a description of the junior-high-school program in Chesapeake.

It should be noted that the Experimental group had attended a completely non-graded school, characterized by the absence of any grade designations whatsoever, the absence of marks and report cards, and continuous pupil progress through curricula and administrative structures designed to implement a systems approach to individualized instruction. The researchers found no evidence in their review of the literature of any study of a more completely non-graded program.

Typically, non-graded schools and/or procedures represent administrative changes rather than complete curricula planning to accommodate the non-graded philosophy. Most non-graded schools

have been effected by changing primarily administrative structures--a consideration which may explain why research endeavors as to non-graded schools are lacking.

Review of Related Research

A thorough search of the professional literature since 1959 had revealed only 22 research studies employing some type of experimental and/or ex post facto procedures relative to non-graded schools.

Eight studies reported positive findings in terms of pupil achievement, primarily in mathematics and/or in reading (Bockrath, 1959; Carbone, 1961; Hickey, 1962; Buffie, 1962; Hillson, Jones, Moore & Van Devender, 1964; Williams, 1966; Corbin, 1967; and Morris, Proger & Morrell, 1971). Nine studies reported no difference among several cognitive variables studied (Finley & Thompson, 1963; Kierstead, 1963; Hopkins, Oldridge & Williamson, 1965; Ross, 1967; Jones, Moore & Van Devender, 1967; Anastasiow, 1968; Case, 1970; McLoughlin, 1970; and Remacle, 1970). Five studies reported mixed findings among various cognitive variables and therefore inconclusive results (Halliwell, 1963; Vogel & Bowers, 1968; Brody, 1970; Bowman, 1971; and Ramayya, 1972).

Only one study cited significant advantages for non-graded schooling in the affective domain (Buffie, 1962); five studies reported no differences in this area between graded and non-graded subjects (Hickey, 1962; Hopkins, Oldridge & Williamson, 1965; Ross, 1967; Case, 1970; and Bowman, 1971).

The present study appears to be most closely related to the work of Morris et al. (1971) and of Ramayya (1972) in that these investigators compared non-graded and graded pupils over a five- or six-year period. Morris et al. (1971) compared the achievement of non-graded pupils with that of graded pupils after three and five years of schooling. Ramayya (1972) compared pupils in a non-graded school with pupils in a graded school as to personality variables, classroom climate, and achievement at the end of six years.

Appendix D provides an analysis of the 22 research studies reviewed in relation to this study.

No one study can answer all the queries posed regarding non-graded schooling; the present study, however, augments existing findings by extending the number and types of variables investigated to 31--10 cognitive and 21 affective. In addition, this study appears to be the first study to compare non-graded and graded pupils at the seventh-grade level and to follow them through the seventh grade.

Another way in which the present study differs from others reported in the professional literature is the use of three control groups, each selected according to different criteria.

Limitations of the Study

When the Chesapeake Demonstration School was conceived, it was not regarded as a research undertaking. As its name implies, it was a demonstration activity. Therefore, this study could not be an experimental study. Rather, this study is an analytical or ex post facto study in that it attempts to determine the level of development of the Chesapeake Demonstration School population of non-graded pupils in a number of dimensions and to study three control populations of graded pupils in these same dimensions.

Although the present study attempts to compare pupils in non-graded and traditional settings as to gains in both cognitive development and certain affective characteristics, no attempt has been made to compare all aspects of pupil growth. Thirty-one aspects of pupil growth and development have been selected for study, however, on the basis of their seeming importance.

No attempt has been made or could have been made to control rigidly such variables as pupil-teacher ratio, years of experience of teachers, hours devoted to given subjects, etc. during the six years of elementary schooling, the effectiveness of which has been investigated in this study. Baseline data from 1967 and 1968 were available, however, for both the Experimental and control groups so that the groups could be compared as they entered school.

The precise origin of the differences found between the Experimental Group and the three control groups cannot be determined because the precise ways in which the schooling of these pupils differed cannot be determined. Some non-graded practices existed in the graded schools (see Appendix B) which control subjects had attended. It should be noted, however, that the Chesapeake Demonstration School pupils had been able to achieve their seventh-grade status without the benefit of any grade designations, including promotions and retentions; any marks or report cards; and any whole-class homework assignments.

It should also be noted that the Experimental pupils were the first group of pupils to complete six years of schooling at the Chesapeake Demonstration School. Their first year there was marked by the usual trauma of the opening of a new school, with additional difficulties accompanying the implementation of a new curriculum and new administrative procedures with which the entire school staff were unfamiliar. The school plant, created for the program, was not completed until approximately three months after school had begun in September, 1967. While the building was being completed, the Chesapeake Demonstration School pupils were housed very inconveniently in a neighboring school. At the end of three years, there was doubt as to whether the program would be extended to the upper elementary levels since the school had originally been planned for primary pupils only. The upper-level program was actually formulated, therefore, as the first pupils experienced it, since it was added only after parents prevailed upon school

officials to expand the program. For these reasons the Experimental Group in this study may not be so fully representative of the effects of the Chesapeake Demonstration School non-graded program as subsequent groups receiving six years of elementary schooling there.

The Experimental population of this study is small, with an n of only 47. It is believed, however, that in terms of both cognitive and affective development, these pupils represent a relatively normal distribution.

The study was conducted entirely in one school division, which is essentially suburban in nature. Caution should be exercised in applying the results of the study to pupils of notably disparate populations. Appendix E provides a description of the City of Chesapeake.

Hypotheses

The specific null hypotheses tested in this study are as follows:

H_1 There will be no significant differences in total intelligence test scores (Kuhlmann-Anderson Test, Booklet G) between the Experimental Group and any of three control groups.

H_2 There will be no significant differences in verbal intelligence test scores (Cognitive Abilities Test) between the Experimental Group and any of three control groups.

H_3 There will be no significant differences in quantitative intelligence test scores (Cognitive Abilities Test) between the Experimental Group and any of three control groups.

H_4 There will be no dignificant differences in nonverbal intelligence test scores (Cognitive Abilities Test) between the Experimental Group and any of three control groups.

H_5 There will be no significant differences in reading scores (SRA Achievement Series) between the Experimental Group and any of three control groups.

H_6 There will be no significant differences in vocabulary scores (SRA Achievement Series) between the Experimental Group and any of three control groups.

H_7 There will be no significant differences in mathematics concepts scores (SRA Achievement Series) between the Experimental Group and any of three control groups.

H_8 There will be no significant differences in mathematics computation scores (SRA Achievement Series) between the Experimental Group and any of three control groups.

H_9 There will be no significant differences in language arts scores (SRA Achievement Series) between the Experimental Group and any of three control groups.

H_{10} There will be no significant differences in spelling scores (SRA Achievement Series) between the Experimental Group and any of three control groups.

H_{11} There will be no significant differences in self-reliance scores (California Test of Personality) between the Experimental Group and any of three control groups.

H_{12} There will be no significant differences in total adjustment scores (California Test of Personality) between the Experimental Group and any of three control groups.

H_{13} There will be no significant differences in locus of control scores (Nowicki-Strickland Scale) between the Experimental Group and any of three control groups.

H_{14} There will be no significant differences in attitudes toward school (Semantic Differential Technique) between the Experimental Group and any of three control groups.

H_{15} There will be no significant differences in attitudes toward math and science activities (Semantic Differential Technique) between the Experimental Group and any of three control groups.

H_{16} There will be no significant differences in attitudes toward home (Semantic Differential Technique) between the Experimental Group and any of three control groups.

H_{17} There will be no significant differences in attitudes toward reading and language arts activities (Semantic Differential Technique) between the Experimental Group and any of three control groups.

H_{18} There will be no significant differences in attitudes toward grownups (Semantic Differential Technique) between the Experimental Group and any of three control groups.

H_{19} There will be no significant differences in attitudes toward classmates (Semantic Differential Technique) between the Experimental Group and any of three control groups.

H_{20} There will be no significant differences in attitudes toward art and music activities (Semantic Differential Technique) between the Experimental Group and any of three control groups.

H_{21} There will be no significant differences in attitudes toward oneself as a person (Semantic Differential Technique) between the Experimental Group and any of three control groups.

H_{22} There will be no significant differences in attitudes toward teachers (Semantic Differential Technique) between the Experimental Group and any of three control groups.

H_{23} There will be no significant differences in attitudes toward oneself as a student (Semantic Differential Technique) between the Experimental Group and any of three control groups.

H_{24} There will be no significant differences in attitudes toward family (Semantic Differential Technique) between the Experimental Group and any of three control groups.

H_{25} There will be no significant differences in attitudes toward homework (Semantic Differential Technique) between the Experimental Group and any of three control groups.

H_{26} There will be no significant differences in scores on the complexity factor, or the degree of differentiation of self-concept, (Self-Social Symbols Tasks) between the Experimental Group and any of three control groups.

H_{27} There will be no significant differences in scores on the centrality factor or perception of one's worth or self-esteem (Self-Social Symbols Tasks) between the Experimental Group and any of three control groups.

H_{28} There will be no significant differences in scores on the dependency factor or perception of oneself as a part of a group as opposed to perception of oneself as an individual (Self-Social Symbols Tasks) between the Experimental Group and any of three control groups.

H_{29} There will be no significant differences in scores on the grouping factor or the number of persons in a group with whom one identifies (Self-Social Symbols Tasks) between the Experimental Group and any of three control groups.

H_{30} There will be no significant differences in scores on the identification-teacher factor (Self-Social Symbols Tasks) between the Experimental Group and any of three control groups.

H_{31} There will be no significant differences in scores on the identification-friend factor (Self-Social Symbols Tasks) between the Experimental Group and any of three control groups.

H_{32}-H_{62} There will be no significant interaction effects between treatment groups and socio-economic levels (Hollingshead) on any of the dependent variables measured in the fall testing (cf. H_1-H_{31}).

H_{63}-H_{93} There will be no significant interaction effects between intelligence levels (Kuhlmann-Anderson Test-Booklet B) on any of the dependent variables measured in the fall testing (cf. H_1-H_{31}).

H_{94}-H_{124} There will be no significant differences in scores obtained in the spring testing on any of the dependent variables (cf. H_1-H_{31}) between the Experimental Group and any of three control groups.

H_{125} There will be no significant differences in creative thinking scores (Onomatopoeia and Images) between the Experimental Group and any of three control groups.

H_{126} There will be no significant differences in total creative personality scores (Something About Myself) between the Experimental Group and any of three control groups.

H_{127} There will be no significant differences in scores on the environmental sensitivity factor(Something About Myself) between the Experimental Group and any of three control groups.

H_{128} There will be no significant differences in scores on the initiative factor (Something About Myself) between the Experimental Group and any of three control groups.

H_{129} There will be no significant differences in scores on the self-strength factor (Something About Myself) between the Experimental Group and any of three control groups.

H_{130} There will be no significant differences in scores on the intellectuality factor (Something About Myself) between the Experimental Group and any of three control groups.

H_{131} There will be no significant differences in scores on the individuality factor (Something About Myself) between the Experimental Group and any of three control groups.

H_{132} There will be no significant differences in scores on the artistry factor (Something About Myself) between the Experimental Group and any of three control groups.

H_{133}-H_{171} There will be no significant interaction effects between treatment groups and socio-economic levels (Hollingshead) on any of the dependent variables measured in the spring testing (cf. H_1-H_{31} and H_{125}-H_{133}).

H_{172}-H_{210} There will be no significant interaction effects between treatment groups and intelligence levels (Kuhlmann-Anderson Test - Booklet B) on any of the dependent variables measured in the spring testing (cf. H_1-H_{31} and H_{125}-H_{132}).

H_{211}-H_{241} There will be no significant differences in net loss or gain in scores obtained at the beginning of the seventh grade and at the end of the seventh grade by pupils in the Experimental Group and by pupils in any of three control groups.

H_{242}-H_{272} There will be no significant interaction effects between treatment groups and socio-economic levels (Hollingshead) on the score increments (net loss or gain in scores obtained at the beginning of the seventh grade and at the end of the seventh grade) relative to any of the dependent variables (cf. H_1-H_{31}).

H_{273}-H_{303} There will be no significant interaction effects between treatment groups and intelligence levels (Kuhlmann-Anderson Test - Booklet B) on score increments (net loss or gain in scores obtained at the beginning of the seventh

grade and at the end of the seventh grade) relative to any of the dependent variables (cf. H_1-H_{31}).

H_{304}-H_{334} There will be no significant differences between fall scores and spring scores for pupils in the Experimental Group on any of the dependent variables (cf. H_1-H_{31}).

H_{335}-H_{365} There will be no significant differences between fall scores and spring scores for pupils in Control Group A on any of the dependent variables (cf. H_1-H_{31}).

H_{366}-H_{396} There will be no significant differences between fall scores and spring scores for pupils in Control Group B on any of the dependent variables (cf. H_1-H_{31}).

H_{397}-H_{427} There will be no significant differences between fall scores and spring scores for pupils in Control Group C on any of the dependent variables (cf. H_1-H_{31}).

Method

This study represents a complex and comprehensive effort to test the efficacy of non-graded schooling over a six-year period. At all stages of its development, the study was conducted under stringent controls to insure both internal and external validity. The specific methods by which the study was conducted are described below.

Subjects

Experimental Group. The experimental group consisted entirely of pupils who had entered the Chesapeake Demonstration School in September, 1967, and had attended that school for six years. Of 118 pupils enrolled in 1967, 52 entered the seventh grade at Western Branch Junior High School in September, 1973. Three pupils had entered that school in September, 1972, since the non-graded structure of the Chesapeake Demonstration School allowed rapidly-achieving pupils to progress according to their own abilities. In accordance with the school philosophy, six pupils also remained at the Chesapeake Demonstration School in the fall of 1973 because it was felt by their parents and school administrators that their personal and academic interests could be served best there.

Of the 118 six-year-olds entering the Chesapeake Demonstration School in 1967, 28 percent, 33 pupils, transferred to other schools in Chesapeake. Attempts to identify specific reasons for the transfer of these pupils to other schools in Chesapeake were relatively unsuccessful. Whereas some parents transferred their children to other schools because they were discontented with the Chesapeake Demonstration School, the predominant reason for transfer was the parents' concern as to the future of the Chesapeake Demonstration School. Since this school had been designed to be a primary school, the question as to whether pupils could remain there through the elementary years arose. Although additional funding and community support ultimately encouraged school officials to make provisions for intermediate pupils, some parents had internalized fears as to whether the intermediate program would materialize; and they subsequently withdrew their children. Other parents removed their children one or two years prior to entry into the junior high school because of concern as to whether non-graded pupils could readily adjust to the junior-high environment and could compete successfully with their graded peers.

Compared to those of the graded schools in Chesapeake, the Chesapeake Demonstration School percentages as to consistent enrollment are very favorable. Of 2,464 pupils who entered graded schools in 1967 as six-year-olds, only 21 percent (512 pupils) entered the seventh grade after six years of schooling in Chesapeake. A very

large number of students transferred from the city--69 percent (1706 pupils); another 10 percent (246 pupils) were retained in one grade or another. Only 20 percent (24 pupils) of the Chesapeake Demonstration School pupils transferred out of the city, however, and only 5 percent (6 pupils) did not enter the seventh grade with their age group. It should be noted that the percentage transferring out of the city from the graded schools was more than three times greater than the percentage who transferred from the Chesapeake Demonstration School. Also, the retention rate in the graded schools was twice that of the Chesapeake Demonstration School. Table 1 portrays the loss by years of the 1967 six-year-olds who left the Chesapeake Demonstration School over the six-year period prior to their entering the seventh grade.

Control Groups. Since the purpose of this study was to compare the achievement of 52 pupils who had had six years of nongraded instruction with that of pupils who had had six years of regular graded instruction in the public schools in Chesapeake, Virginia, the entire seventh-grade population of that city, 2,391 pupils, excluding the Experimental pupils, were considered as possible control pupils.

Teams of persons from Old Dominion University examined the cumulative records of all seventh-graders in the six junior high schools of Chesapeake who had attended Chesapeake graded schools exclusively prior to entering the seventh grade. A total of 512 pupils were found who met this qualification. Baseline data relative to age, sex, race, socio-economic level, 1967 Metropolitan Readiness Test: Form A (Hildreth, Griffiths & McGauvran, 1964) scores, and 1968 Kuhlmann-Anderson Test: Booklet B (Kuhlmann & Anderson, 1960) deviation IQ scores were logged on each of the 512 possible control pupils.

The age criterion was established as twelve years, or the pupil's being born between October 2, 1960, and October 1, 1961.

Socio-economic status was determined according to Hollingshead's Classifications (Hollingshead, 1958) based on the education and occupation of each pupil's father. The levels 1-5 represent descending socio-economic status.

Five IQ levels were established as follows: (a) 75-90; (b) 91-100; (c) 101-110; (d) 111-120; (e) 121-135; with the Kuhlmann-Anderson 1968 IQ's used to assign pupils to IQ levels.

The specific procedures for selecting each of the control groups were as follows:

1. Matched-pairs procedures were used to select the first control group, hereafter to be known as Control Group A, from among the 512 pupils identified as possible control pupils. It should be noted that in the selection of Control Group A pupils, as in the selection of all control pupils, those with profound disabling conditions were eliminated from the study.

Table 1

Pupils Who Left
Chesapeake Demonstration School, 1967-73,
from the Six-Year-Old Class of 1967

Year	Moved from Chesapeake	Transferred within Chesapeake	Other	Total
1967-68	1	2	0	3
1968-69	5	2	0	7
1969-70	4	10	0	14
1970-71	2	11	2	15
1971-72	3	3	0	6
1972-73	5	5	5	15
Total	20	33	7	60
1973-74			*6	6
Total not Entering the Seventh Grade				66

*remained at Chesapeake
Demonstration School

Attempts were made to match each Experimental pupil (possible n=52) with a control subject (possible n=52) on the basis of age, sex, race, socio-economic level, 1967 Metropolitan Readiness Test raw scores (within at least eight points or one-half SD of Experimental Group scores), and 1968 Kuhlmann-Anderson Test scores (IQ's within at least six points--one-half SD of Experimental Group scores).

Experimental pupils were considered individually as matched controls were sought. Each control pupil who fell within the allowable score limits on the matching criteria was considered as a possible match for each Experimental pupil. A graph was constructed on which were plotted the 1967 Metropolitan Readiness Test raw scores and the 1968 Kuhlmann-Anderson IQ scores of the Experimental pupils and of all possible control pupils. The control pupil whose plotted point appeared by inspection to be closest to each Experimental pupil's point was selected as his match. If a clear-cut decision could not be made by inspection, the following formula was applied:

$$(z_{KA\,exp.} - z_{KA\,con.})^2 + (z_{MET\,exp.} - z_{MET\,con.})^2$$

In the event that the same control pupil was the best match for more than one Experimental pupil, a random selection technique was used.

Forty-seven pairs of pupils meeting all criteria were found. No control pupils could be found to match five Experimental pupils; therefore, 47 matched pairs evolved rather than 52, as had been planned. The loss of a control pupil reduced the number of matched pairs to 46 in the spring.

The resulting control group was very closely matched with the Experimental Group according to the standardized tests used as matching criteria--i.e., Metropolitan Readiness Test (Experimental Group: $\bar{M}$=60.02, SD=13.68; Control Group A: $\bar{M}$= 59.82, SD=14.01); Kuhlmann-Anderson Test (Experimental Group: $\bar{M}$= 110.85, SD=9.30; Control Group A: $\bar{M}$=109.63, SD=8.79). In addition, of course, each pupil in the Experimental Group had a counterpart in Control Group A of the same age, sex, race, and socio-economic level.

Following is a summary of the eight matching criteria:

1. All elementary schooling in Chesapeake, Virginia
2. Only six years of elementary schooling
3. Birthdate between October 2, 1960, and October 1, 1961
4. Sex
5. Race
6. Socio-economic level
7. Metropolitan Readiness Test scores
8. Kuhlmann-Anderson Test deviation IQ scores

2. A second control group, hereafter to be known as Control Group B, was selected by a stratified-random sampling technique.

All Experimental and possible control pupils were grouped into categories according to age, sex, race, socio-economic level, and Kuhlmann-Anderson Test IQ levels. Each category or cell in which Experimental pupils were present was given a letter denotation (A through T). The percentage of Experimental pupils in each cell was computed. A comparable percentage of the total available control group (n=512) was then randomly selected from the distribution of control pupils within each cell. Final random selection of control pupils was made on the basis of a three-to-one ratio (Experimental to control) for each cell except for five cells, where sufficient control pupils did not exist.

Only one Experimental pupil was in the lowest intelligence-test-score level (75-90); therefore, all possible control pupils in this intelligence-test-score level as well as the one Experimental subject in this level were eliminated from their respective populations. Since the Experimental population consisted of pupils in only socio-economic levels 3 and 4, all pupils from the 512 possible control pupils in levels 1, 2, and 5 were eliminated. In all, 106 control pupils were selected for Control Group B. During the 1973-1974 school year, while the pupils were in the seventh grade, six Control Group B pupils moved from Chesapeake. Control Group B included 100 pupils at the end of the seventh grade.

When one Experimental pupil in the lowest-intelligence level was eliminated, the Experimental Group was reduced to 51 pupils for both fall and spring testing.

The Metropolitan Readiness Test raw scores used for matching the Experimental pupils and Control Group B pupils suggested that the groups were very homogeneous (Experimental Group: M=60.27, SD=13.24; Control Group B: M=60.45, SD=15.43). The Kuhlmann-Anderson Test scores were equivalent as to central tendency but differed somewhat as to variance (Experimental Group: M=11.57, SD=9.53; Control Group B: M=111.74, SD=13.24).

3. The last of three control groups, hereafter to be known as Control Group C, was drawn from the total seventh-grade population of approximately 400 pupils at the Western Branch Junior High School, where 55 pupils who had attended Chesapeake graded elementary schools for six years were enrolled. Of the 55 pupils regarded as possible control pupils, 42 were selected when socio-economic and intelligence-level factors were considered in relation to the Experimental Group. The group was added to the study because each pupil in it had attended a graded elementary school in the same neighborhood as the Experimental pupils.

The resulting Control Group C consisted of 42 pupils at the

beginning of the seventh grade (fall). During the course of the school year, Control Group C was reduced by one pupil, with a resulting n of 41 at the end of the seventh grade (spring). As with Control Group B, 51 Experimental pupils were included.

The 1967 Metropolitan Readiness scores and the 1968 Kuhlmann-Anderson IQ's were compared for the Experimental Group and Control Group C. The Metropolitan Readiness Test scores were relatively equivalent (Experimental Group: M=60.27, SD=13.24; Control Group C: M=60.33, SD=15.55). There did not appear to be a significant difference between the mean Kuhlmann-Anderson IQ scores of the Experimental Group (M=111.57) and of the Control Group (M=112.79). The standard deviations were significantly different, however, with Control Group C scores (SD=14.41) reflecting greater variance than the Experimental Group scores (SD=9.53).

The variance in Kuhlmann-Anderson Test scores for Control Group C, and to a lesser degree for Control Group B, may be attributed to the relatively high standard error of measurement of this test since such variance was not present in the Metropolitan Readiness Test raw score means and/or standard deviations. Furthermore, according to Kirk (1968), analysis of variance, the statistical procedure used by the investigators, is "so robust with respect to violation of the assumption of homogeneity of error variance, it is not customary to test this assumption routinely."

Table 2 depicts the populations by schools (the Experimental Group and Control Groups A,B, and C) participating in the fall (1973) testing.

Table 3 depicts by schools numbers of Experimental pupils and pupils in Control Groups A,B, and C participating in the spring (1974) testing.

Instrumentation and Data Collection. Two highly regarded measures of intelligence were used at both the beginning and the end of the seventh grade for both Experimental and control pupils. The seventh edition of the Kuhlmann-Anderson Test, Booklet G, (Kuhlmann & Anderson, 1960) provided a general index to intelligence level. The Cognitive Abilities Test, Verbal, Nonverbal, and Quantitative Batteries, Form 1, Levels A-H (Thorndike & Hagan, 1971) provided specific scores as to three applications of relational thinking measured in three media. The total reliability coefficient of the Kuhlmann-Anderson Test is .91. The Kuder-Richardson #20 reliability coefficients of the Cognitive Abilities Test are as follows: Verbal Battery, .94; Quantitative Battery, .93; Nonverbal Battery, .91. Both instruments have been intensively studied as to content, construct, and concurrent validity. They compare favorably with other group tests of intelligence, and even with individual intelligence tests, such as the Stanford-Binet Intelligence Scale.

Achievement was measured by the SRA Achievement Series, Multi-Level Form E/Green Level with the following subtests being administered: Reading, Vocabulary, Mathematics Concepts, Mathematics Com-

Table 2

Pupils Participating in
Fall, 1973 Testing by Group and School

Junior High School	Experimental Group	Control A	Control B	Control C
Crestwood		6	10	
Deep Creek		13	26	
Great Bridge		1	10	
Indian River		16	26	
Truitt		6	19	
Western Branch	51	5	15	42
Total	51	47	106	42

Table 3

Pupils Participating in
Spring, 1974, Testing by Group and School

Junior High School	Experimental Group	Control A	Control B	Control C
Crestwood		5	8	
Deep Creek		13	25	
Great Bridge		1	10	
Indian River		16	24	
Truitt		6	19	
Western Branch	51	5	14	41
Total	51	46	100	41

putation, Language Arts, and Spelling. Kuder-Richardson #20 reliability coefficients for these subtests are as follows: Reading, .93; Vocabulary, .93; Mathematics Concepts, .88; Mathematics Computation, .93; Language Arts, .92; Spelling, .93. Validity is postulated by the authors' careful selection of content.

The California Test of Personality, Intermediate Form AA (Thorpe, Clark, and Tiegs, 1953) was used as a general measure of adjustment, with one subtest used to assess self-reliance. The Kuder-Richardson reliability coefficient reported for the Total Adjustment score is .96, and for the Self-Reliance score, .70. The validity of this test has been established by wide use over a number of years and by the careful scrutiny of the test by experts.

The Nowicki-Strickland Scale (Nowicki & Strickland, 1973) was used to test the pupils' sense of source of control (external or internal) in his/her life. A split-half reliability coefficient of .68 for Grades 6, 7, and 8 is reported for the Nowicki-Strickland Scale. The authors suggest that the instrument is sufficiently reliable in light of the fact that the items are not arranged according to difficulty. The test-retest reliability coefficient is .66. Validity of the instrument has been investigated by comparisons with other measures of locus of control. (See Appendix F for a copy of this instrument.)

The Semantic Differential Technique (Osgood, Suci & Tannenbaum, 1957) is a frequently used instrument in educational research where assessment in the affective domain is desired. In the present study, Osgood's five-point scale was used to test pupils' attitudes toward several aspects of their environment and of their own lives. Twelve pairs of bipolar adjectives with purest loading on the evaluative factor were chosen. The resulting instrument, developed by the investigators following a conference with Osgood, was designed to assess attitudes toward My School, Math and Science Activities, My Home, Reading and Language Arts, Grown-Ups, My Classmates, Art and Music Activities, Myself as a Person, Teachers, Myself as a Student, My Family, and Homework. (See Appendix G for a copy of the Semantic Differential instrument developed for use in this study and for the directions developed for its administration.)

The Self-Social Symbols Tasks (Long, Henderson & Ziller, 1973) are designed to measure twelve aspects of self-concept, six of which were selected for use in the present study. The following split-half reliability coefficients are reported for these factors: Complexity, .83; Centrality, .58; Dependency, .84; Grouping, .88; Identification Teacher, .86; Identification Friend, .78. The instrument was developed following seven years of work on three original tests by the senior author, who had been awarded a grant from the National Science Foundation. Empirical validity is postulated by the authors, who have attempted to construct an instrument based upon their belief

that self-concept is a set of crude groupings or orderings in which the self is related to significant other persons. A non-verbal medium is used in which symbols represent relationships in one's life space.

The spring testing was augmented by the use of a test of creative thinking, Onomatopoeia and Images (Khatena & Torrance, 1973). The authors of Onomatopoeia and Images report alternate-form reliability coefficients of .76 to .92. The validity of the test is satisfactory, according to the authors, who found low correlations between scores on this test and scores on general measures of intelligence but high correlations with scores of other measures of creative thinking.

Something About Myself (Khatena, 1971) was also added to the spring testing battery. It is a creativity checklist based upon the rationale that creativity is reflected in one's personality characteristics, his creative thinking strategies, and his creative productions. Split-half reliability coefficients of .92 to .95 are reported by the author, with test-retest reliability coefficients being .77 to .98. The author cites evidence of construct, concurrent, and predictive validity. Something About Myself has been factor-analyzed into the following factors: environmental sensitivity, initiative, self-strength, intellectuality, individuality, and artistry. In addition, there is a total creative personality score. Reliability coefficients of these factors were not available as this report was prepared. (See Appendix H for a copy of the prepublication version of Something About Myself used in this study.)

The original testing of the Experimental Group and Control Group C was completed in six sessions of approximately two hours each in the latter part of September, 1973 (September 12-September 19). Two trained technicians administered the tests in each of several testing stations, to which both Experimental and control subjects were randomly assigned. Similar procedures were followed in early October (October 1-October 8) for the testing of Control Groups A and B, who were in six junior high schools. It should be noted that although subjects were in schools in different boroughs of the city, testing was executed on the same days. Explicit written instructions, discussed in several training sessions, were supplied to all persons administering the tests; and carefully standardized testing protocols were followed throughout the testing procedures.

Each test was scored twice, first by one trained scorer and then by another, to insure accuracy of scoring. In one instance, where subjective decisions were required (Self-Social Symbols Tasks), precise directions were developed for scoring. Certain sections of the test were omitted because of possible ambiguities in interpretation of responses.

Similar procedures were employed for the spring testing, which took place in the first two weeks of May, 1974 (May 6-May 15) at

the end of the seventh grade. Approximately twelve hours were needed for administration of the entire spring test battery.

A list of the complete testing battery appears in Appendix I.

Design. This study was implemented to compare the effectiveness of six years of non-graded and graded schooling. Since it was not conceived until the non-graded pupils were completing their elementary schooling, an *ex post facto* design was necessary (Ary, Jacobs & Razavich, 1972).

Three control groups were used to increase both the internal and external validity of the findings. Control Group A, selected to provide an extremely carefully equated group for the Experimental Group, was a matched-pairs group according to eight criteria. Control Group B was included in the study to provide a representative population from 21 graded elementary schools and was therefore selected by use of stratified-random-sampling procedures among pupils screened to be possible controls. Control Group C was added to the study to provide a control population from the same geographical-cultural-social milieu as that of the Experimental Group and was therefore composed entirely of pupils who had attended elementary schools in the same borough of the city as the Experimental pupils and who were enrolled in the same junior high school as the Experimental pupils.

Since the study was also designed to determine whether any differences present between non-graded and graded pupils upon entry into the seventh grade remained throughout that school year, testing was executed in both the fall and the spring. There were 31 dependent variables relevant to both fall and spring testing. Eight additional dependent variables were added to the spring testing--specifically, Onomatopoeia and Images as well as the total score and six factors of Something About Myself. (See Appendix I for a complete list of all 39 dependent variables.)

A three-way randomized block factorial analysis of variance design (Kirk, 1968), with pupils blocked on intelligence and socio-economic level, was used to compare the Experimental Group with each of the three control groups for both fall and spring testing. This analysis-of-variance design was used to reduce error variance for maximum statistical power--i.e., to detect all possible mean differences and interaction effects between treatment groups, socio-economic levels, and intelligence levels.

Socio-economic levels and intelligence levels were used as factors since it is widely recognized that they are significantly related to both academic achievement and affective development.

Hollingshead's Index of Social Position was used to determine socio-economic classifications (five levels). Only levels 3 and 4 classifications were used, however, since no Experimental pupils were in levels 1, 2, or 5. Second-year Kuhlmann-Anderson (1968)

scores, stratified into five levels, were used as the intelligence factor. The lowest IQ level, level I (75 to 90 IQ) was deleted because there was only one Experimental pupil in this level.

Only first-order interactions were observed because it was assumed that higher-order interactions would be insignificant.

A three-way randomized block factorial analysis of covariance design (Kirk, 1968), with pupils blocked on intelligence and socio-economic status as described above, was used to determine which of the four groups (Experimental Group, Control Group A, Control Group B, or Control Group C) evidenced the most significant gains in the seventh grade on 21 variables measured in the fall and again in the spring. Deviation IQ's from the 1968 administration of the Kuhlmann-Anderson Test: Booklet B were used as the covariate.

Again, only first-order interactions were observed since it was assumed that higher-order interactions would be insignificant.

To minimize Type I errors a one-way analysis of variance design (Kirk, 1968) was used to determine the significance of gain scores for each group separately on each of 31 variables tested in the fall and in the spring.

The assumptions necessary for the use of the three primary statistical techniques employed in this study described above appear to have been met.

The Statistical Analysis System (Barr & Goodnight, 1972) was used in all data analysis.

Results

This section of this report is divided into four parts. First, findings relative to the Experimental Group vs. Control Group A, including data from both fall and spring testing, are presented. Subsequently, findings as to the Experimental Group vs. Control Group B and findings as to the Experimental Group vs. Control Group C are described. Finally, comparisons among the four groups as to fall-spring scores are presented, along with findings as to gain scores between fall and spring testing of each of the four groups: Experimental, Control Group A, Control Group B, and Control Group C.

Experimental Group vs. Control Group A

Fall testing. Table 4 lists the three significant main effects and the two interactions that occurred for the Experimental Group vs. Control Group A. All other effects involving these two groups failed to reach significance.

Inspection of Table 4 shows that Control Group A pupils scored significantly higher on the Art-Music, Teacher, and Myself as a Student factors of the Semantic Differential.

There was a significant interaction between treatment groups and socio-economic status on the Nowicki-Strickland Scale--i.e., less affluent Experimental pupils scored lower, but there was no difference among Control Group A pupils across socio-economic levels.

A second significant interaction occurred between treatment groups and intelligence levels on the My Family factor of the Semantic Differential, suggesting that intelligence level had a differential but inconsistent effect on treatment groups--i.e., Experimental pupils in both the highest- and lowest-intelligence levels scored higher than did Experimental pupils in the two middle-intelligence levels; but the reverse was true for Control Group A pupils.

Spring testing. Table 5 lists the one significant main effect and the six interactions that occurred for the Experimental Group vs. Control Group A. All other effects involving these two groups failed to reach significance.

Inspection of Table 5 shows that Control Group A pupils scored significantly higher than the Experimental Group on the Initiative factor of Something About Myself.

There was a significant interaction between treatment groups and socio-economic levels on the Nowicki-Strickland Scale--i.e., more affluent Experimental pupils scored lower, but there were no differences among Control Group A pupils in either socio-economic level.

Three significant interactions occurred between treatment

Table 4

Means, Standard Deviations, and Observed Values of F for Significant Main Effects and Observed Values of F for Significant Interactions Among Treatment Groups, Intelligence Levels, and Socio-Economic Levels for Experimental Group vs. Control Group A -- Fall Testing

Factors	Levels	n	M	SD	df	F	p
SDAM[a]	Experimental Group	46	47.53	11.54	1/84	4.58	.05
	Control Group A	46	51.19	10.28			
SDTE[b]	Experimental Group	46	48.45	9.48	1/84	4.69	.05
	Control Group A	46	51.60	11.75			
SDMYS[c]	Experimental Group	46	48.79	7.09	1/84	4.25	.05
	Control Group A	46	51.34	5.88			
N-S[d]	Treatment x SES				1/84	6.31	.05
SDMYF[e]	Treatment x IQ				3/84	3.51	.05

Note. The tests...

[a]Semantic Differential: Art-Music

[b]Semantic Differential: Teachers

[c]Semantic Differential: Myself as a Student

[d]Nowicki-Strickland Scale

[e]Semantic Differential: My Family

Table 5

Means, Standard Deviations, and Observed Values of F
for Significant Main Effects and
Observed Values of F for Significant Interactions Among
Treatment Groups, Intelligence Levels,
and Socio-Economic Levels
for Experimental Group vs. Control Group A -- Spring Testing

Factors	Levels	n	M	SD	df	F	p
SAMINT[a]	Experimental Group	43	7.74	1.57	1/76	4.95	.05
	Control Group A	43	6.67	1.77			
N-S[b]	Treatment x SES				1/82	6.73	.05
SDMH[c]	Treatment x IQ				3/82	2.99	.05
SDAM[d]	Treatment x IQ				3/82	4.05	.01
SDMYF[e]	Treatment x IQ				3/82	3.80	.05
SSSCOMP[f]	Treatment x SES				1/82	4.39	.05
SAMES[g]	Treatment x IQ				3/82	2.79	.05

Note. The tests...

[a]Something About Myself: Intellectuality

[b]Nowicki-Strickland Scale

[c]Semantic Differential: My Home

[d]Semantic Differential: Art-Music

[e]Semantic Differential: My Family

[f]Self-Social Symbols Tasks: Complexity

[g]Something About Myself: Environmental Sensitivity

groups and intelligence levels on the My Home, Art-Music, and My Family factors of the Semantic Differential, suggesting that intelligence level had a differential but inconsistent effect on treatment groups. Experimental pupils in the lowest-intelligence level scored higher on these factors of the Semantic Differential than did the lowest-intelligence-level Control Group A pupils. Across the three higher-intelligence levels there was no consistent pattern.

A fifth significant interaction occurred between treatment groups and socio-economic levels on the Complexity factor of the Self-Social Symbols Tasks--i.e., the more affluent Experimental pupils scored slightly higher than did the more affluent pupils in Control Group A, but the reverse was true for the less affluent pupils.

A sixth significant interaction occurred between treatment groups and intelligence levels on the Environmental Sensitivity factor of Something About Myself--i.e., the more intelligent Experimental pupils scored somewhat higher, but the lowest-intelligence-level Control Group A pupils scored somewhat lower.

Experimental Group vs. Control Group B

Fall testing. Table 6 lists the four significant main effects for the Experimental Group vs. Control Group B. All other main effects involving these two groups failed to reach significance.

Inspection of Table 6 shows that the Experimental Group scored significantly higher than Control Group B on the Mathematics Concepts subtest of the SRA Achievement Series and on the Centrality factor of the Self-Social Symbols Tasks. The Experimental Group scored significantly lower on the Art-Music and Myself as a Student factors of the Semantic Differential.

Table 7 lists the seven significant interactions that occurred for the Experimental Group vs. Control Group B. All other interactions involving these two groups failed to reach significance.

As Table 7 depicts, a significant interaction occurred between treatment groups and socio-economic levels on the Total Adjustment score of the California Test of Personality--i.e., the more affluent Experimental pupils scored somewhat higher than the more affluent Control Group B pupils, but the less affluent Experimental pupils scored slightly lower than the less affluent Control Group B pupils.

A second significant interaction occurred between treatment groups and socio-economic levels on the Nowicki-Strickland Scale--i.e., the more affluent Experimental pupils scored somewhat lower than the more affluent Control Group B pupils, but the less affluent pupils scored approximately the same.

A third significant interaction occurred between treatment

Table 6

Means, Standard Deviations, and Observed Values of F
for Significant Main Effects
for Experimental Group vs. Control Group B — Fall Testing

Factors	Levels	n	M	SD	df	F	p
SRAMCON[a]	Experimental Group	51	26.78	6.62	1/147	4.25	.05
	Control Group B	106	22.99	7.39			
SDAM[b]	Experimental Group	51	47.82	10.53	1/147	7.01	.01
	Control Group B	106	51.06	7.68			
SDMYS[c]	Experimental Group	51	48.94	6.41	1/147	5.15	.05
	Control Group B	106	50.87	5.98			
SSSCENT[d]	Experimental Group	51	3.04	1.98	1/147	4.91	.05
	Control Group B	106	2.38	1.67			

Note. The tests...

[a]SRA Achievement Series: Mathematics Concepts

[b]Semantic Differential: Art-Music

[c]Semantic Differential: Myself as a Student

[d]Self-Social Symbols Tasks: Centrality

Table 7

Observed Values of *F* for Significant Interactions Among Treatment Groups, Intelligence Levels, and Socio-Economic Levels for Experimental Group vs. Control Group B -- Fall Testing

Factors	Interacting Levels	df	F	p
CPTA[a]	Treatment x SES	1/147	4.05	.05
N-S[b]	Treatment x SES	1/147	8.39	.01
SDMS[c]	Treatment x IQ	3/147	3.23	.05
SDGR[d]	Treatment x IQ	3/147	2.71	.05
SDMYF[e]	Treatment x IQ	3/147	3.54	.05
SSSDEP[f]	Treatment x SES	1/147	4.07	.05
SSSG[g]	Treatment x IQ	3/147	3.66	.05

Note. The tests...

[a]California Test of Personality: Total Adjustment

[b]Nowicki-Strickland Scale

[c]Semantic Differential: My School

[d]Semantic Differential: Grown-Ups

[e]Semantic Differential: My Family

[f]Self-Social Symbols Tasks: Dependency

[g]Self-Social Symbols Tasks: Grouping

groups and intelligence levels on the My School factor of the Semantic Differential -- i.e., Experimental pupils in the three lowest-intelligence levels scored somewhat higher than Control Group B pupils in these levels; however, Experimental pupils in the highest-intelligence level scored somewhat lower than Control Group B pupils. A fourth significant interaction occurred between treatment groups and intelligence levels on the Grown-Ups factor of the Semantic Differential, suggesting that intelligence level had a differential but inconsistent effect on treatment groups -- i.e., Experimental pupils in the lowest-intelligence level scored somewhat higher than Control Group B pupils in the same intelligence level. Control Group B pupils across all four intelligence levels evidenced more consistent attitudes toward grown-ups than did Experimental pupils. A fifth significant interaction occurred between treatment groups and intelligence levels on the My Family factor of the Semantic Differential, suggesting that intelligence had a differential but inconsistent effect on treatment groups -- i.e., Experimental pupils in the three highest-intelligence levels scored somewhat lower than did Control Group B pupils in the same three levels, but the reverse was true of pupils in the lowest-intelligence level.

A sixth significant interaction occurred between treatment groups and socio-economic levels on the Dependency factor of the Self-Social Symbols Tasks -- i.e., the more affluent Experimental pupils scored slightly higher than did the more affluent Control Group B pupils, but the less affluent Experimental pupils scored lower than did the less affluent Control Group B pupils. A seventh significant interaction occurred between treatment groups and intelligence levels on the Grouping factor of the Self-Social Symbols Tasks, suggesting that intelligence level had a differential but inconsistent effect on treatment groups. Experimental pupils in the lowest-intelligence level scored higher than did Control Group B pupils in the same intelligence level; but the reverse was true for pupils in the highest-intelligence level, with pupils in middle-intelligence levels scoring approximately the same.

Spring testing. Table 8 lists the two significant main effects that occurred for the Experimental Group vs. Control Group B. All other main effects involving these two groups failed to reach significance.

Inspection of Table 8 shows that the Experimental Group scored significantly higher on the Verbal Battery of the Cognitive Abilities Test, while Control Group B pupils scored significantly higher on the Myself as a Student factor of the Semantic Differential.

Table 9 lists the eight significant interactions that occurred for the Experimental Group vs. Control Group B. All other interactions involving these two groups failed to reach significance.

Table 8

Means, Standard Deviations, and Observed Values of F
for Significant Main Effects
for Experimental Group vs. Control Group B -- Spring Testing

Factors	Levels	n	M	SD	df	F	p
CAVERBAL[a]	Experimental Group	51	78.55	10.06	1/141	4.13	.05
	Control Group B	100	72.75	15.87			
SDMYS[b]	Experimental Group	51	53.14	7.09	1/141	4.13	.05
	Control Group B	100	54.91	6.74			

Note. The tests...

[a]Cognitive Abilities Test: Verbal Battery

[b]Semantic Differential: My School

Table 9

Observed Values of F for Significant Interactions Among Treatment Groups, Intelligence Levels, and Socio-Economic Levels for Experimental Group vs. Control Group B -- Spring Testing

Factors	Interacting Levels	df	F	p
CPSR[a]	Treatment x SES	1/141	3.40	.05
CPTA[b]	Treatment x SES	1/141	5.22	.01
N-S[c]	Treatment x SES	1/141	8.65	.01
SDMAS[d]	Treatment x IQ	3/141	3.59	.05
SDMH[e]	Treatment x IQ	3/141	3.28	.05
SDGR[f]	Treatment x IQ	3/141	2.87	.05
SDAM[g]	Treatment x IQ	3/141	13.87	.01
SDMYF[h]	Treatment x IQ	3/141	3.08	.05
SAMES[i]	Treatment x IQ	3/140	2.85	.05

Note. The tests...

[a] California Test of Personality: Self-Reliance

[b] California Test of Personality: Total Adjustment

[c] Nowicki-Strickland Scale

[d] Semantic Differential: Math-Science

[e] Semantid Differential: My Home

[f] Semantic Differential: Grown-Ups

[g] Semantic Differential: Art-Music

[h] Semantic Differential: My Family

[i] Something About Myself: Environmental Sensitivity

As Table 9 depicts, a significant interaction occurred between treatment groups and socio-economic levels on the Self-Reliance subtest of the California Test of Personality--i.e., the more affluent Experimental pupils scored slightly higher than did the more affluent Control Group B pupils, but the less affluent Experimental pupils scored lower than the less affluent Control Group B pupils. A second significant interaction occurred between treatment groups and socio-economic levels on the Total Adjustment score of the California Test of Personality--i.e., the more affluent Experimental pupils scored higher than did the more affluent Control Group B pupils, but the less affluent Experimental pupils scored somewhat lower than the less affluent Control Group B pupils.

A third significant interaction occurred between treatment groups and socio-economic levels on the Nowicki-Strickland Scale--i.e., the more affluent Experimental pupils scored somewhat lower than did Control Group B pupils, but the less affluent Experimental pupils scored somewhat higher than the less affluent Control Group B pupils.

A fourth significant interaction occurred between treatment groups and intelligence levels on the Mathematics-Science factor of the Semantic Differential, suggesting that intelligence had a differential but inconsistent effect on treatment groups, with the highest-intelligence-level Experimental pupils scoring somewhat lower than the highest-intelligence-level pupils in Control Group B. A fifth significant interaction occurred between treatment groups and intelligence levels on the My Home factor of the Semantic Differential, suggesting that intelligence had a differential but inconsistent effect on treatment groups, with the lowest-intelligence-level Experimental pupils scoring somewhat higher than the lowest-intelligence-level pupils in Control Group B; however, the reverse was true of pupils in the highest-intelligence level. A sixth significant interaction occurred between treatment groups and intelligence levels on the Grown-Ups factor of the Semantic Differential, suggesting that intelligence had a differential but inconsistent effect on treatment groups--i.e., Control Group B pupils across all four intelligence levels evidenced more consistent attitudes toward grown-ups than did Experimental pupils. A seventh significant interaction occurred between treatment groups and intelligence levels on the Art-Music factor of the Semantic Differential, suggesting that intelligence had a differential but inconsistent effect on treatment groups, with the lowest-intelligence-level pupils in the Experimental Group scoring higher than the lowest-intelligence-level pupils in Control Group B; however, the reverse was true of pupils in the highest-intelligence level. An eighth significant interaction occurred between treatment groups and intelligence levels on the My Family factor of the Semantic Differential, suggesting that intelligence had a differential but inconsistent effect on the Experimental pupils while intelligence level did not appear to affect pupils in Control Group B.

A ninth significant interaction occurred between treatment groups and intelligence levels on the Environmental Sensitivity factor of Something About Myself--i.e., Experimental pupils in

the lowest-intelligence level scored somewhat higher than Control Group B pupils in this level; however, Experimental pupils and Control Group B pupils scored more nearly the same across the three higher-intelligence levels.

Experimental Group vs. Control Group C

Fall testing. Table 10 lists the three significant main effects that occurred for the Experimental Group vs. Control Group C. All other main effects involving these two groups failed to reach significance.

Inspection of Table 10 shows that the Experimental pupils scored significantly higher on the Nonverbal Battery of the Cognitive Abilities Test, while pupils in Control Group C scored significantly higher on the Art-Music and Teacher factors of the Semantic Differential.

Table 11 lists the seven significant interactions that occurred for the Experimental Group vs. Control Group C. All other interactions involving these two groups failed to reach significance.

As Table 11 depicts, a significant interaction occurred between treatment groups and socio-economic levels on the Quantitative Battery of the Cognitive Abilities Test -- i.e., the less affluent Experimental pupils scored somewhat higher than the less affluent Control Group C pupils, but the more affluent pupils of both groups scored more nearly the same.

A second significant interaction occurred between treatment groups and intelligence levels on the Total Adjustment score on the California Test of Personality -- i.e., intelligence level had a differential but inconsistent effect on treatment groups, with the lowest-intelligence-level pupils in the Experimental group scoring somewhat higher than the lowest-intelligence-level pupils in Control Group C; however, the reverse was true of pupils in the highest-intelligence level.

A third significant interaction occurred between treatment groups and intelligence levels on the My School factor of the Semantic Differential -- i.e., Experimental pupils in the highest-intelligence level scored somewhat lower than Control Group C pupils in this level; however, Experimental pupils in the three lower-intelligence levels scored somewhat higher than Control Group C pupils in these levels. A fourth significant interaction occurred between treatment groups and socio-economic levels on the My Home factor of the Semantic Differential -- i.e., the more affluent Experimental pupils scored lower than did the more affluent Control Group C pupils, but the less affluent pupils in both groups scored approximately the same. A fifth significant interaction occurred between treatment groups and intelligence levels on the Grown-Ups factor of the Semantic Differential -- i.e., Experimental pupils in the highest-intelligence level scored

Table 10

Means, Standard Deviations, and Observed Values of F
for Significant Main Effects
for Experimental Group vs. Control Group C — Fall Testing

Factors	Levels	n	M	SD	df	F	p
CANON[a]	Experimental Group	51	65.24	10.31	1/83	4.49	.05
	Control Group C	42	57.90	13.13			
SDAM[b]	Experimental Group	51	47.82	10.53	1/83	5.01	.05
	Control Group C	42	51.17	6.93			
SDTE[c]	Experimental Group	51	48.88	11.26	1/83	5.00	.05
	Control Group C	42	51.05	7.47			

Note. The tests...

[a]Cognitive Abilities Test: Nonverbal Battery

[b]Semantic Differential: Art-Music

[c]Semantic Differential: Teachers

Table 11

Observed Values of F for Significant Interactions Among Treatment Groups, Intelligence Levels, and Socio-Economic Levels for Experimental Group vs. Control Group C — Fall Testing

Factors	Interacting Levels	df	F	p
CAQUANT[a]	Treatment x SES	1/83	4.33	.05
CPTA[b]	Treatment x IQ	3/83	2.79	.05
SDMS[c]	Treatment x IQ	3/83	3.22	.05
SDMH[d]	Treatment x SES	1/83	5.53	.05
SDGR[e]	Treatment x IQ	3/83	4.01	.05
SDMAP[f]	Treatment x SES	1/83	5.04	.05
SDMYS[g]	Treatment x SES	1/83	4.24	.05
SSSG[h]	Treatment x IQ	3/83	5.54	.01

Note. The tests...

[a] Cognitive Abilities Test: Quantitative Battery

[b] California Test of Personality: Total Adjustment

[c] Semantic Differential: My School

[d] Semantic Differential: My Home

[e] Semantic Differential: Grown-Ups

[f] Semantic Differential: Myself as a Person

[g] Semantic Differential: Myself as a Student

[h] Self-Social Symbols Tasks: Grouping

lower than pupils in Control Group C in the highest-intelligence level, but the reverse was true for pupils in the lowest-intelligence level. A sixth significant interaction occurred between treatment groups and socio-economic levels on the Myself as a Person factor of the Semantic Differential--i.e., the more affluent Experimental pupils scored lower than the more affluent pupils in Control Group C, but the less affluent pupils in both groups scored approximately the same. A seventh significant interaction occurred between treatment groups and socio-economic levels on the Myself as a Student factor of the Semantic Differential--i.e., the more affluent pupils scored lower than did the more affluent Control Group C pupils, but the reverse was true for the less affluent pupils.

An eighth interaction occurred between treatment groups and intelligence and on the Grouping factor of the Self-Social Symbols Tasks--i.e., Experimental pupils in the highest-intelligence level scored lower than pupils in Control Group C in the highest-intelligence level, but the reverse was true for pupils in the lowest-intelligence level.

Spring testing. Table 12 lists the three significant main effects that occurred for the Experimental Group vs. Control Group C. All other main effects involving these two groups failed to reach significance.

Inspection of Table 12 shows that Experimental pupils scored significantly higher than Control Group C pupils on the Reading and Vocabulary subtests of the SRA Achievement Series and on the Centrality factor of the Self-Social Symbols Tasks.

Table 13 lists the twelve significant interactions that occurred for the Experimental Group vs. Control Group C. All other interactions involving these two groups failed to reach significance.

As Table 13 indicates, there was a significant interaction between treatment groups and socio-economic levels on the Mathematics Concepts subtest of the SRA Achievement Series--i.e., the less affluent Experimental pupils scored somewhat higher than the less affluent Control Group C pupils, but the more affluent pupils of both groups scored approximately the same.

A second significant interaction occurred between treatment groups and socio-economic levels on the Total Adjustment score of the California Test of Personality, suggesting that intelligence level had a differential but inconsistent effect on treatment groups. Experimental pupils in the lowest-intelligence level scored higher than Control Group C pupils in the lowest-intelligence level, but the reverse was true for pupils in the highest-intelligence level.

A third significant interaction occurred between treatment groups and intelligence levels on the Nowicki-Strickland Scale, suggesting that intelligence level had a differential but inconsistent effect on treatment groups; however, Experimental pupils in both the lowest- and highest-intelligence levels scored lower than did Control Group C pupils in the same intelligence levels.

A fourth significant interaction occurred between treatment groups and socio-economic levels on the My Home factor of the Semantic Differential--i.e., the less affluent Experimental

Table 12

Means, Standard Deviations, and Observed Values of F
for Significant Main Effects for
Experimental Group vs. Control Group C -- Spring Testing

Factors	Levels	n	M	SD	df	F	p
SRAR[a]	Experimental Group	51	37.75	8.00	1/82	4.43	.05
	Control Group C	41	30.44	10.99			
SRAV[b]	Experimental Group	51	35.04	5.90	1/82	6.52	.05
	Control Group C	41	29.29	9.54			
SSSCENT[c]	Experimental Group	51	2.16	1.82	1/82	5.47	.05
	Control Group C	41	3.10	1.74			

Note. The tests...

[a] SRA Achievement Series: Reading

[b] SRA Achievement Series: Vocabulary

[c] Self-Social Symbols Tasks: Centrality

Table 13

Observed Values of F for Significant Interactions Among Treatment Groups, Intelligence Levels, and Socio-Economic Levels for Experimental Group vs. Control Group — Spring Testing

Factor	Interacting Levels	df	F	p
SRAMCON[a]	Treatment x SES	1/82	4.62	.05
CPTA[b]	Treatment x IQ	3/82	3.06	.05
N-S[c]	Treatment x IQ	3/82	3.13	.05
SDMH[d]	Treatment x SES	1/82	7.88	.01
SDMH[e]	Treatment x IQ	3/82	4.26	.01
SDGR[f]	Treatment x SES	1/82	5.71	.05
SDGR[g]	Treatment x IQ	3/82	4.55	.01
SDAM[h]	Treatment x IQ	3/82	3.95	.05
SSSDEP[i]	Treatment x IQ	3/82	3.79	.05
SSSCOMP[j]	Treatment x SES	1/82	4.78	.05
SAMES[k]	Treatment x SES	1/82	4.08	.05
SAMINT[l]	Treatment x SES	1/82	7.15	.01

Note. The tests...

[a]SRA Achievement Series: Mathematics Concepts

[b]California Test of Personality: Total Adjustment

[c]Nowicki-Strickland Scale

[d]Semantic Differential: My h...e

Table 13 (Continued)

[f] Semantic Differential: My Home

[g] Semantic Differential: Grown-Ups

[h] Semantic Differential: Grown-Ups

[i] Semantic Differential: Art-Music

[j] Self-Social Symbols Tasks: Dependency

[k] Self-Social Symbols Tasks: Complexity

[l] Something About Myself: Environmental Sensitivity

[m] Something About Myself: Individuality

pupils scored lower than did the more affluent Control Group C pupils, but the reverse was true for the less affluent pupils. A fifth significant interaction occurred between treatment groups and intelligence levels on the My Home factor of the Semantic Differential, suggesting that intelligence had a differential but inconsistent effect on treatment groups, with the lowest-intelligence-level pupils in the Experimental Group scoring somewhat higher than the lowest-intelligence-level pupils in Control Group C; however, the reverse was true of pupils in the highest-intelligence level. A sixth significant interaction occurred between treatment groups and socio-economic levels on the Grown-Ups factor of the Semantic Differential -- i.e., the more affluent Experimental pupils scored lower than the more affluent Control Group C pupils, but the less affluent pupils in both groups scored approximately the same. A seventh significant interaction occurred between treatment groups and intelligence levels on the Grown-Ups factor of the Semantic Differential, suggesting that intelligence level had a differential but inconsistent effect on treatment groups--i.e., Experimental pupils in both the lowest- and highest-intelligence levels scored somewhat higher than did Control Group C pupils in the same two intelligence levels. An eighth significant interaction occurred between treatment groups and intelligence levels on the Art-Music factor of the Semantic Differential, suggesting that intelligence level had a differential but inconsistent effect on treatment groups--i.e., Experimental pupils in the lowest-intelligence level scored higher than did Control Group C pupils in the same level, but the reverse was true of pupils in the highest-intelligence level.

A ninth significant interaction occurred between treatment groups and intelligence levels on the Dependency factor of the Self-Social Symbols Tasks, suggesting that intelligence level had a differential but inconsistent effect on treatment groups--i.e., Experimental pupils in both the highest- and lowest intelligence levels scored higher than did Control Group C pupils in the same intelligence levels. A tenth significant interaction occurred between treatment groups and socio-economic levels on the Complexity factor of the Self-Social Symbols Tasks--i.e., the more affluent Experimental pupils scored lower than did the more affluent Control Group C pupils, but the less affluent pupils scored approximately the same.

An eleventh significant interaction occurred between treatment groups and socio-economic levels on the Environmental Sensitivity factor of Something About Myself--i.e., the more affluent Experimental pupils scored slightly higher than did the more affluent Control Group C pupils, but the less affluent Experimental pupils scored slightly lower than did the less affluent Control Group C pupils. A twelfth significant interaction occurred between treatment groups and socio-economic levels on the Initiative factor of Something About Myself--i.e., the more affluent Experimental pupils scored somewhat higher than did the more affluent Control Group C

pupils, but the less affluent pupils scored approximately the same.

Fall-Spring Gains by Groups

Experimental Group vs. Control Groups A,B, and C, fall-spring. Of the 31 main effects tested, only the Identification Friend factor of the Self-Social Symbols Tasks was found to be significant in favor of Control Group A. This finding is probably an artifact representing a Type I error.

Three significant interactions were noted, however, which may be more than artifacts. There was a significant interaction between treatment groups and socio-economic levels on the Quantitative Battery of the Cognitive Abilities Test -- i.e., less affluent pupils in the three control groups scored slightly higher than the more affluent pupils in the three control groups, but the reverse was true for the Experimental pupils.

A second significant interaction occurred between treatment groups and socio-economic levels on the Language Arts subtest of the SRA Achievement Series -- i.e., the less affluent Experimental and Control Group C pupils scored somewhat higher than the more affluent pupils of the same group, but the reverse was true for Control Groups A and B.

A third significant interaction occurred between treatment groups and intelligence levels on the Art-Music factor of the Semantic Differential, suggesting that intelligence had a differential but inconsistent effect on treatment groups -- i.e., the more intelligent pupils in Control Groups A,B, and C scored somewhat higher than the less intelligent pupils. Intelligence level had no consistent effect on the Experimental pupils; however, those in the highest-intelligence level scored somewhat lower than those in the lowest-intelligence level.

Experimental Group, fall-spring. Table 14 lists 10 cognitive main effects for fall vs. spring testing of the Experimental Group. Inspection of Table 14 shows that the Experimental pupils scored significantly higher in the spring than in the fall testing on nine of 10 cognitive variables (all intelligence and achievement measures except the Language Arts subtest of the SRA Achievement Series.)

Table 15 lists the 21 affective main effects for fall vs. spring testing of the Experimental Group. Inspection of Table 15 shows that the Experimental pupils scored significantly higher in the spring testing on only one variable, the Dependency factor of the Self-Social Symbols Tasks. Experimental pupils scored significantly lower in the spring testing, however, on 10 affective measures: Nowicki-Strickland Scale; Semantic Differential: My School; Semantic Differential: Math and Science Activities; Semantic Differential: Reading and Language Arts (English Activities); Semantic Differential: Grown-Ups; Semantic Differential: Teachers; Semantic Differential: Myself as a Student; Semantic Differential: Homework;

Table 14

Means and Observed Values of F for Gain Scores
Between Fall and Spring Testing
for the Experimental Group -- Cognitive Variables

Variable	n	M Fall	M Spring	df	F	p
IQ[a]	52	103.48	109.60	1/51	51.04	.01
CAVERBAL[b]	52	70.75	77.92	1/51	86.18	.01
CAQUANT[c]	52	37.48	41.81	1/51	26.20	.01
CANON[d]	52	54.98	68.35	1/51	23.17	.01
SRAR[e]	52	33.50	37.38	1/51	24.35	.01
SRAV[f]	52	31.77	34.69	1/51	28.12	.01
SRAMCON[g]	52	26.69	28.46	1/51	10.36	.01
SRAMCOM[h]	52	24.17	27.90	1/51	31.54	.01
SRALA[i]	52	48.77	50.37	1/51	1.98	ns
SRAS[j]	52	23.62	26.48	1/51	35.69	.01

Note. The tests...

[a]Kuhlmann-Anderson Test

[b]Cognitive Abilities Test: Verbal Battery

[c]Cognitive Abilities Test: Quantitative Battery

[d]Cognitive Abilities Test: Nonverbal Battery

[e]SRA Achievement Series: Reading

[f]SRA Achievement Series: Vocabulary

[g]SRA Achievement Series: Mathematics Concepts

[h]SRA Achievement Series: Mathematics Computations

[i]SRA Achievement Series: Language Arts

[j]SRA Achievement Series: Spelling

Table 15

Means and Observed Values of F for Gain Scores
Between Fall and Spring Testing
for the Experimental Group -- Affective Variables

Variable	n	M Fall	M Spring	df	F	p
CPSR[a]	52	7.75	7.81	1/51	.05	ns
CPTA[b]	52	106.37	109.02	1/51	2.86	ns
N-S[c]	52	12.10	10.46	1/51	5.59	.05
SDMS[d]	52	48.15	43.83	1/51	10.41	.01
SDMAS[e]	52	49.83	43.94	1/51	28.02	.01
SDMH[f]	52	54.48	53.50	1/51	1.51	ns
SDRL[g]	52	48.88	45.54	1/51	6.04	.05
SDGR[h]	52	51.31	47.94	1/51	17.75	.01
SDCL[i]	52	48.33	47.17	1/51	1.57	ns
SDAM[j]	52	47.13	46.04	1/51	.60	ns
SDMAP[k]	52	49.02	47.98	1/51	1.12	ns
SDTE[l]	52	48.17	44.00	1/51	8.56	.01
SDMYS[m]	52	49.08	47.02	1/51	4.45	.05
SDMYF[n]	52	54.15	53.04	1/51	1.46	ns
SDHO[o]	52	43.08	36.87	1/51	17.42	.01
SSSCOMP[p]	52	23.75	24.40	1/51	1.66	ns
SSSCENT[q]	52	2.98	2.19	1/51	4.16	.05
SSSDEP[r]	52	3.65	4.33	1/51	5.63	.05
SSSC[s]	52	16.65	18.19	1/51	2.71	ns
SSSIT[t]	52	.31	.12	1/51	6.10	.05
SSSIF[u]	52	1.52	1.48	1/51	.18	ns

Table 15 (Continued)

Note. The tests...

[a]California Test of Personality: Self-Reliance

[b]California Test of Personality: Total Adjustment

[c]Nowicki-Strickland Scale

[d]Semantic Differential: My School

[e]Semantic Differential: Math and Science Activities

[f]Semantic Differential: My Home

[g]Semantic Differential: Reading and Language Arts (English Activities)

[h]Semantic Differential: Grown-Ups

[i]Semantic Differential: My Classmates

[j]Semantic Differential: Art and Music Activities

[k]Semantic Differential: Myself as a Person

[l]Semantic Differential: Teachers

[m]Semantic Differential: Myself as a Student

[n]Semantic Differential: My Family

[o]Semantic Differential: Homework

[p]Self-Social Symbols Tasks: Complexity

[q]Self-Social Symbols Tasks: Centrality

[r]Self-Social Symbols Tasks: Dependency

[s]Self-Social Symbols Tasks: Grouping

[t]Self-Social Symbols Tasks: Identification Teacher

[u]Self-Social Symbols Tasks: Identification Friend

Self-Social Symbols Tasks: Centrality; Self-Social Symbols Tasks: Dependency; Self-Social Symbols Tasks; Identification Teacher. There were no significant differences between fall and spring scores on the nine remaining affective measures.

Control Group A, fall-spring. Table 16 lists 10 main effects for fall vs. spring testing of Control Group A. Inspection of Table 16 shows that Control Group A pupils scored significantly higher in the spring than in the fall testing on nine of 10 cognitive variables (all intelligence and achievement measures except the Language Arts subtest of the SRA Achievement Series).

Table 17 lists the 21 affective main effects for fall vs. spring testing of Control Group A: Inspection of Table 17 shows that Control Group A pupils scored significantly lower in the spring testing on four affective variables: Nowicki-Strickland Scale; Semantic Differential: My School; Semantic Differential: Teachers; Semantic Differential: Homework. There were no significant differences between fall and spring scores on the remaining affective measures.

Control Group B, fall-spring. Table 18 lists 10 cognitive main effects for fall vs. spring testing of Control Group B. Inspection of Table 18 shows that Control Group B pupils scored significantly higher in the spring testing on all 10 cognitive variables.

Table 19 lists 21 affective main effects for fall vs. spring testing of Control Group B. Inspection of Table 19 shows that Control Group B pupils scored significantly higher in the spring testing on only two variables, the Complexity and the Dependency factors of the Self-Social Symbols Tasks. Control Group B pupils scored significantly lower in the spring testing, however, on seven affective measures: Nowicki-Strickland Scale; Semantic Differential: My Home; Semantic Differential: Reading and Language Arts (English Activities); Semantic Differential: Grown-Ups; Semantic Differential: Art and Music Activities; Semantic Differential: Teachers; Semantic Differential: Homework. There were no significant differences between fall and spring scores on the 12 remaining affective measures.

Control Group C, fall-spring. Table 20 lists 10 cognitive main effects for fall vs. spring testing of Control Group C. Inspection of Table 20 shows that Control Group C pupils scored significantly higher in the spring than in the fall testing on all 10 cognitive variables.

Table 21 lists the 21 affective main effects for fall vs. spring testing of Control Group C. Inspection of Table 21 shows that Control Group C pupils scored significantly higher in the spring testing on only one affective variable, the Dependency factor of the Self-Social Symbols Tasks. Control Group C pupils scored significantly lower in the spring testing, however, on six affective measures: Nowicki-Strickland Scale; Semantic Differential: Math and Science Activities; Semantic Differential: Grown-Ups; Semantic Differential:

Art and Music Activities; Semantic Differential: Teachers; Semantic Differential: Homework. There were no significant differences between fall and spring scores on the 14 remaining affective measures.

Table 16

Means and Observed Values of F for Gain Scores Between Fall and Spring Testing for the Control Group A -- Cognitive Variables

Variable	n	M Fall	M Spring	df	F	p
IQ[a]	47	102.11	108.34	1/46	38.18	.01
CAVERBAL[b]	47	66.26	73.13	1/46	108.48	.01
CAQUANT[c]	47	37.64	40.87	1/46	17.00	.01
CANON[d]	47	62.17	66.30	1/46	13.71	.01
SRAR[e]	47	31.51	33.70	1/46	8.90	.01
SRAV[f]	47	30.40	31.81	1/46	5.06	.05
SRAMCON[g]	47	24.32	26.47	1/46	16.10	.01
SRAMCOM[h]	47	22.68	28.45	1/46	57.48	.01
SRALA[i]	47	47.87	49.53	1/46	3.35	ns
SRAS[j]	47	24.74	26.77	1/46	12.86	.01

Note. The tests...

[a] Kuhlmann-Anderson Test

[b] Cognitive Abilities Test: Verbal Battery

[c] Cognitive Abilities Test: Quantitative Battery

[d] Cognitive Abilities Test: Nonverbal Battery

[e] SRA Achievement Series: Reading

[f] SRA Achievement Series: Vocabulary

[g] SRA Achievement Series: Mathematics Concepts

[h] SRA Achievement Series: Mathematics Computations

[i] SRA Achievement Series: Language Arts

[j] SRA Achievement Series: Spelling

Table 17

Means and Observed Values of F for Gain Scores
Between Fall and Spring Testing
for the Control Group A -- Affective Variables

Variable	n	M Fall	M Spring	df	F	p
CPSR[a]	47	7.87	8.26	1/46	2.10	ns
CPTA[b]	47	108.38	108.94	1/46	.11	ns
N-S[c]	47	12.34	9.70	1/46	18.29	.01
SDMS[d]	47	48.15	46.26	1/46	4.28	.05
SDMAS[e]	47	49.26	48.02	1/46	1.13	ns
SDMH[f]	47	55.77	54.28	1/46	3.10	ns
SDRL[g]	47	49.28	46.98	1/46	2.88	ns
SDGR[h]	47	50.74	48.85	1/46	3.86	ns
SDCL[i]	47	47.68	47.45	1/46	.04	ns
SDAM[j]	47	51.06	48.83	1/46	2.64	ns
SDMAP[k]	47	51.04	49.94	1/46	2.11	ns
SDTE[l]	47	51.30	45.64	1/46	12.88	.01
SDMYS[m]	47	51.15	50.40	1/46	.72	ns
SDMYF[n]	47	55.28	53.70	1/46	2.99	ns
SDHO[o]	47	44.45	37.45	1/46	13.73	.01
SSSCOMP[p]	47	23.47	24.28	1/46	2.12	ns
SSSCENT[q]	47	2.60	2.34	1/46	.67	ns
SSSDEP[r]	47	4.23	4.62	1/46	2.16	ns
SSSG[s]	47	17.79	18.91	1/46	1.70	ns
SSSIT[t]	47	.38	.30	1/46	.53	ns
SSSIF[u]	47	1.45	1.60	1/46	1.41	ns

Table 17 (Continued)

Note. The tests...

[a]California Test of Personality: Self-Reliance

[b]California Test of Personality: Total Adjustment

[c]Nowicki-Strickland Scale

[d]Semantic Differential: My School

[e]Semantic Differential: Math and Science Activities

[f]Semantic Differential: My Home

[g]Semantic Differential: Reading and Language Arts (English Activities)

[h]Semantic Differential: Grown-Ups

[i]Semantic Differential: My Classmates

[j]Semantic Differential: Art and Music Activities

[k]Semantic Differential: Myself as a Person

[l]Semantic Differential: Teachers

[m]Semantic Differential: Myself as a Student

[n]Semantic Differential: My Family

[o]Semantic Differential: Homework

[p]Self-Social Symbols Tasks: Complexity

[q]Self-Social Symbols Tasks: Centrality

[r]Self-Social Symbols Tasks: Dependency

[s]Self-Social Symbols Tasks: Grouping

[t]Self-Social Symbols Tasks: Identification Teacher

[u]Self-Social Symbols Tasks: Identification Friend

Table 18

Means and Observed Values of F for Gain Scores
Between Fall and Spring Testing
for the Control Group B -- Cognitive Variables

Variable	n	M Fall	M Spring	df	F	p
IQ[a]	101	101.12	107.63	1/100	146.34	.01
CAVERBAL[b]	101	67.19	72.92	1/100	90.25	.01
CAQUANT[c]	101	37.06	40.76	1/100	47.64	.01
CANON[d]	101	61.09	65.16	1/100	35.89	.01
SRAR[e]	101	31.45	33.81	1/100	18.19	.01
SRAV[f]	101	29.90	32.07	1/100	28.16	.01
SRAMCON[g]	101	23.72	26.14	1/100	32.77	.01
SRAMCOM[h]	101	22.17	27.93	1/100	126.54	.01
SRALA[i]	101	46.31	49.32	1/100	24.99	.01
SRAS[j]	101	23.27	25.28	1/100	24.48	.01

Note. The tests...

[a]Kuhlmann-Anderson Test

[b]Cognitive Abilities Test: Verbal Battery

[c]Cognitive Abilities Test: Quantitative Battery

[d]Cognitive Abilities Test: Nonverbal Battery

[e]SRA Achievement Series: Reading

[f]SRA Achievement Series: Vocabulary

[g]SRA Achievement Series: Mathematics Concepts

[h]SRA Achievement Series: Mathematics Computations

[i]SRA Achievement Series: Language Arts

[j]SRA Achievement Series: Spelling

Table 19

Means and Observed Values of F for Gain Scores
Between Fall and Spring Testing
for the Control Group B — Affective Variables

Variable	n	M Fall	M Spring	df	F	p
CPSR[a]	101	8.09	8.12	1/100	.02	ns
CPTA[b]	101	105.63	107.57	1/100	2.50	ns
N-S[c]	101	13.12	11.01	1/100	20.42	.01
SDMS[d]	101	46.62	45.62	1/100	1.72	ns
SDMAS[e]	101	48.03	47.02	1/100	1.31	ns
SDMH[f]	101	55.76	54.61	1/100	4.46	.05
SDRL[g]	101	48.23	46.26	1/100	6.30	.01
SDGR[h]	101	50.18	48.12	1/100	7.57	.01
SDCL[i]	101	48.66	48.05	1/100	.55	ns
SDAM[j]	101	51.01	48.65	1/100	7.33	.01
SDMAP[k]	101	50.87	49.73	1/100	3.04	ns
SDTE[l]	101	49.60	46.33	1/100	8.54	.01
SDMYS[m]	101	50.90	49.70	1/100	3.30	ns
SDMYF[n]	101	55.70	54.96	1/100	1.90	ns
SDHO[o]	101	43.29	36.52	1/100	28.49	.01
SSSCOMP[p]	101	23.71	24.48	1/100	4.24	.05
SSSCENT[q]	101	2.46	2.43	1/100	.02	ns
SSSDEP[r]	101	4.04	4.96	1/100	17.94	.01
SSSG[s]	101	17.54	18.03	1/100	.55	ns
SSSIT[t]	101	.34	.32	1/100	.06	ns
SSSIF[u]	101	1.38	1.44	1/100	.50	ns

Table 19 (Continued)

Note. The tests...

[a]California Test of Personality: Self-Reliance

[b]California Test of Personality: Total Adjustment

[c]Nowicki-Strickland Scale

[d]Semantic Differential: My School

[e]Semantic Differential: Math and Science Activities

[f]Semantic Differential: My Home

[g]Semantic Differential: Reading and Language Arts (English Activities)

[h]Semantic Differential: Grown-Ups

[i]Semantic Differential: My Classmates

[j]Semantic Differential: Art and Music Activities

[k]Semantic Differential: Myself as a Person

[l]Semantic Differential: Teachers

[m]Semantic Differential: Myself as a Student

[n]Semantic Differential: My Family

[o]Semantic Differential: Homework

[p]Self-Social Symbols Tasks: Complexity

[q]Self-Social Symbols Tasks: Centrality

[r]Self-Social Symbols Tasks: Dependency

[s]Self-Social Symbols Tasks: Grouping

[t]Self-Social Symbols Tasks: Identification Teacher

[u]Self-Social Symbols Tasks: Identification Friend

Table 20

Means and Observed Values of F for Gain Scores
Between Fall and Spring Testing
for the Control Group C -- Cognitive Variables

Variable	n	M Fall	M Spring	df	F	p
IQ[a]	54	97.15	103.17	1/53	36.31	.01
CAVERBAL[b]	54	59.93	68.22	1/53	75.61	.01
CAQUANT[c]	54	32.59	37.22	1/53	49.03	.01
CANON[d]	54	57.13	64.15	1/53	45.79	.01
SRAR[e]	54	25.57	28.89	1/53	17.15	.01
SRAV[f]	54	25.54	27.70	1/53	15.17	.01
SRAMCON[g]	54	22.33	23.76	1/53	4.45	.05
SRAMCOM[h]	54	19.85	26.06	1/53	95.22	.01
SRALA[i]	54	43.07	45.35	1/53	12.26	.01
SRAS[j]	54	21.22	23.26	1/53	15.92	.01

Note. The tests...

[a]Kuhlmann-Anderson Test

[b]Cognitive Abilities Test: Verbal Battery

[c]Cognitive Abilities Test: Quantitative Battery

[d]Cognitive Abilities Test: Nonverbal Battery

[e]SRA Achievement Series: Reading

[f]SRA Achievement Series: Vocabulary

[g]SRA Achievement Series: Mathematics Concepts

[h]SRA Achievement Series: Mathematics Computations

[i]SRA Achievement Series: Language Arts

[j]SRA Achievement Series: Spelling

Table 21

Means and Observed Values of F for Gain Scores
Between Fall and Spring Testing
for the Control Group C — Affective Variables

Variable	n	M Fall	M Spring	df	F	p
CPSR[a]	54	7.80	8.00	1/53	.55	ns
CPTA[b]	54	107.61	108.00	1/53	.05	ns
N-S[c]	54	14.65	11.81	1/53	19.28	.01
SDMS[d]	54	46.69	44.72	1/53	1.95	ns
SDMAS[e]	54	47.81	45.54	1/53	4.53	.05
SDMH[f]	54	53.80	53.13	1/53	.89	ns
SDRL[g]	54	46.33	44.81	1/53	1.19	ns
SDGR[h]	54	51.91	49.28	1/53	9.49	.01
SDCL[i]	54	48.02	47.22	1/53	.34	ns
SDAM[j]	54	50.91	45.52	1/53	14.85	.01
SDMAP[k]	54	50.65	49.17	1/53	3.26	ns
SDTE[l]	54	50.15	45.35	1/53	8.44	.01
SDMYS[m]	54	49.35	48.37	1/53	1.22	ns
SDMYF[n]	54	54.17	53.63	1/53	.54	ns
SDHO[o]	54	44.59	40.09	1/53	9.27	.01
SSSCOMP[p]	54	23.44	23.98	1/53	1.24	ns
SSSCENT[q]	54	2.81	2.96	1/53	.28	ns
SSSDEP[r]	54	3.39	4.50	1/53	15.68	.01
SSSC[s]	54	17.09	17.48	1/53	.14	ns
SSSI[t]	54	.33	.26	1/53	.50	ns
SSSI[u]	54	1.48	1.24	1/53	3.78	ns

Table 21 (Continued)

Note. The tests...

[a]California Test of Personality: Self-Reliance

[b]California Test of Personality: Total Adjustment

[c]Nowicki-Strickland Scale

[d]Semantic Differential: My School

[e]Semantic Differential: Math and Science Activities

[f]Semantic Differential: My Home

[g]Semantic Differential: Reading and Language Arts (English Activities)

[h]Semantic Differential: Grown-Ups

[i]Semantic Differential: My Classmates

[j]Semantic Differential: Art and Music Activities

[k]Semantic Differential: Myself as a Person

[l]Semantic Differential: Teachers

[m]Semantic Differential: Myself as a Student

[n]Semantic Differential: My Family

[o]Semantic Differential: Homework

[p]Self-Social Symbols Tasks: Complexity

[q]Self-Social Symbols Tasks: Centrality

[r]Self-Social Symbols Tasks: Dependency

[s]Self-Social Symbols Tasks: Grouping

[t]Self-Social Symbols Tasks: Identification Teacher

[u]Self-Social Symbols Tasks: Identification Friend

Findings by Hypotheses

As this study evolved, 427 null hypotheses were postulated. Since it was not feasible to answer each of these null hypotheses singularly, for the convenience of the reader the investigators grouped them into meaningful units which are presented below. The reader is referred to pages 13-18 for a listing of the null hypotheses. Also, Appendix J provides a list of the numbers of the hypotheses as they relate to each variable.

Many of the hypotheses are actually statements regarding 3 possible findings since there were 3 control groups in this study. For example, hypotheses 1-31 involve 93 comparisons. Hence, there are many more comparisons than hypotheses.

As stated, a null hypothesis is rejected if any 1 of the 3 control groups is significantly different from the Experimental Group. Had each possible comparison included in this study been formulated as an hypothesis, the number of hypotheses would have totaled 1033.

Main Effects, Fall E(A,B,C)

Hypotheses H_1-H_{31}. Of the 31 null hypotheses tested comparing the Experimental Group with 3 control groups in the fall, only 6 were rejected: H_4,H_7,H_{20},H_{22},H_{23}, and H_{27}. There were 3 differences in favor of the Experimental Group and 3 in favor of 1 or more of the control groups.

Only 10 of 93 comparisons made between Experimental and control groups reached the level of significance; also, the Experimental Group did not outperform more than 1 control group on any 1 variable. Attitude toward art-music, as measured by the Semantic Differential (H_{20}), was the only variable on which all 3 control groups outperformed the Experimental Group.

According to these findings, at the beginning of the seventh grade there were few differences in either cognitive or affective development of pupils who had attended non-graded and graded elementary schools for 6 years.

Interaction Effects, Socio-economic Levels, Fall, E(A,B,C)

Hypotheses H_{32}-H_{62}. Of the 31 null hypotheses tested for interaction effects between treatment groups and socio-economic levels on the dependent variables measured in the fall, only 7 were rejected: H_{34},H_{43},H_{44},H_{47},H_{52},H_{54}, and H_{59}.

Only 8 of 93 possible interactions reached the level of significance.

These findings indicate that socio-economic level had a differential but inconsistent effect upon treatment groups. No meaningful interaction patterns were observed.

Interaction Effects, Intelligence Levels, Fall, E(A,B,C)

Hypotheses H_{63}-H_{93}. Of the 31 null hypotheses tested for interaction effects between treatment groups and intelligence levels on the dependent variables measured in the fall, only 5 were rejected: H_{74}, H_{76}, H_{80}, H_{86}, and H_{91}.

Only 9 of 93 possible interactions reached the level of significance, with all of these being among the affective variables. In each of the 9 interactions between intelligence levels and treatment groups, lowest-IQ Experimental pupils scored higher than lowest-IQ control pupils; however, in 7 of the 9 interactions, highest-IQ Experimental pupils scored lower than highest-IQ control pupils.

These findings indicate that the lowest-IQ pupils appeared to have profited more from non-graded instruction than from graded instruction while the reverse was true for highest-IQ pupils.

Main Effects, Spring, E(A,B,C)

Hypotheses H_{94}-H_{124}. Of the 31 null hypotheses tested comparing the Experimental Group with 3 control groups in the spring, only 5 were rejected: H_{95}, H_{98}, H_{99}, H_{116}, and H_{120}. There were 3 differences in favor of the Experimental Group; 1, in favor of Control Group B; and 1, in favor of Control Group C.

Only 5 of 93 comparisons made reached the level of significance. In no instance did the Experimental Group outperform more than 1 control group on any 1 variable, and there was no variable on which the Experimental Group scored higher than Control Group A. It should be noted, however, that 3 of the 5 variables on which the Experimental Group scored significantly higher than 1 or more control groups were verbal in nature: Verbal Battery of Cognitive Abilities Test (H_{95}) and Reading (H_{98}) and Vocabulary (H_{99}) subtests of the SRA Achievement Series. There was no variable on which all 3 control groups outperformed the Experimental Group.

At the end of the seventh grade, there were fewer significant differences between pupils who had attended a non-graded elementary school and pupils who had attended graded elementary schools than at the beginning of that grade.

Main Effects, Additional Variables, Spring, E(A,B,C)

Hypotheses H_{125}-H_{132}. Of the 8 null hypotheses tested comparing the Experimental Group with 3 control groups on 8 affective variables added to the spring testing, only 1 was rejected: H_{130}. The difference was in favor of the Experimental Group and probably represents an artifact.

Interaction Effects, Socio-Economic Levels, Spring, E(A,B,C)

Hypotheses H_{133}-H_{171}. Of the 39 null hypotheses tested for interaction effects between treatment groups and socio-economic levels on all 39 dependent variables measured in the spring, only 9 were

rejected: H_{139}, H_{143}, H_{144}, H_{145}, H_{148}, H_{150}, H_{158}, H_{166}, and H_{169}.

Only 11 of 117 possible interactions reached the level of significance.

These findings indicate that socio-economic level had a differential but inconsistent effect upon treatment groups. No meaningful interaction patterns were observed.

Interaction Effects, Intelligence Levels, Spring, E(A,B,C)

Hypotheses H_{172}-H_{210}. Of the 39 null hypotheses tested for interaction effects between treatment groups and intelligence levels on all 39 dependent variables measured in the spring, 9 were rejected: H_{183}, H_{184}, H_{186}, H_{187}, H_{189}, H_{191}, H_{195}, H_{199}, and H_{205}.

Of 117 possible interactions, 16 reached the level of significance, with all of these being among the affective variables. In 15 of the 16 interactions between intelligence levels and treatment groups, lowest-IQ Experimental pupils scored significantly higher than lowest-IQ control pupils; however, in 14 of these 16 interactions highest-IQ Experimental pupils scored lower than highest-IQ control pupils.

These findings, like the fall findings in regard to treatment groups and intelligence-level interactions, indicate that the lowest-IQ pupils profited more from non-graded instruction than from graded instruction, while the reverse was true for highest-IQ pupils.

Main Effects, Fall-Spring Gain Scores, E(A,B,C)

Hypotheses H_{211}-H_{241}. Of the 31 null hypotheses tested comparing the Experimental Group with 3 control groups as to net loss or gain in scores obtained at the beginning of the seventh grade and at the end of the seventh grade, only 1 was rejected: H_{241}.

Since only 1 of 93 possible comparisons reached the level of significance, it was dismissed as an artifact.

Interaction Effects, Fall-Spring Gain Scores, Socio-Economic Levels, E(A,B,C)

Hypotheses H_{242}-H_{272}. Of the 31 null hypotheses tested for interaction effects between treatment groups and socio-economic levels on all variables tested in the fall and in the spring, only 2 were rejected: H_{244} and H_{250}.

Only 2 of 93 possible interactions reached the level of significance.

These findings indicate that socio-economic level had a differential but inconsistent effect upon treatment groups. No meaningful interaction patterns were observed.

Interaction Effects, Fall-Spring Gain Scores, Intelligence Levels, E(A,B,C)

Hypotheses H_{273}-H_{303}. Of the 31 null hypotheses tested for interaction effects between treatment groups and intelligence levels

on all variables tested in the fall and in the spring, only 1 was rejected: H_{292}.

Only 1 of 93 possible interactions reached the level of significance.

These findings indicate that intelligence level had a differential but inconsistent effect upon treatment groups. No meaningful interaction patterns were observed.

Main Effects, Fall-Spring Gain Scores, E (E)

Hypotheses H_{304}-H_{334}. Of the 31 null hypotheses comparing fall and spring scores of the Experimental Group, 20 were rejected: H_{304}, H_{305}, H_{306}, H_{307}, H_{308}, H_{309}, H_{310}, H_{311}, H_{313}, H_{316}, H_{317}, H_{318}, H_{320}, H_{321}, H_{325}, H_{326}, H_{328}, H_{330}, H_{331}, and H_{333}. Experimental pupils scored significantly higher on 9 of 10 cognitive variables measured in the spring testing; however, they scored significantly lower on 10 of 21 affective variables and significantly higher on only 1 affective variable.

These findings indicate that whereas the Experimental pupils made significant gains on the cognitive variables during the seventh grade, there were significant decreases in scores on a number of affective variables measured.

Main Effects, Fall-Spring Gain Scores, A (A)

Hypotheses H_{335}-H_{365}. Of the 31 null hypotheses comparing fall and spring scores of Control Group A, 13 were rejected: H_{335}, H_{336}, H_{337}, H_{338}, H_{339}, H_{340}, H_{341}, H_{342}, H_{344}, H_{347}, H_{348}, H_{356}, and H_{359}. Control Group A pupils scored significantly higher on 9 of 10 cognitive variables measured in the spring testing; however, they scored significantly lower on 4 of 21 affective variables and significantly higher on no affective variables.

These findings indicate that whereas the Control Group A made significant gains on the cognitive variables during the seventh grade, there were significant decreases in scores on some of the affective variables measured.

Main Effects, Fall-Spring Gain Scores, B (B)

Hypotheses H_{366}-H_{396}. Of the 31 null hypotheses comparing fall and spring scores of Control Group B, 19 were rejected: H_{366}, H_{367}, H_{368}, H_{369}, H_{370}, H_{371}, H_{372}, H_{374}, H_{375}, H_{378}, H_{381}, H_{382}, H_{383}, H_{385}, H_{387}, H_{390}, H_{391}, and H_{393}. Control Group B pupils scored significantly higher on all 10 cognitive variables measured in the spring testing; however, they scored significantly lower on 7 of 21 affective variables and significantly higher on only 2 affective variables.

These findings indicate that whereas the Control Group B pupils made significant gains on the cognitive variables during the seventh grade, there were significant decreases in scores on a number of

affective variables measured.

Main Effects, Fall-Spring Gain Scores, C (C)

Hypotheses H_{397}-H_{427}. Of the 31 null hypotheses comparing fall and spring scores of Control Group C, 17 were rejected: H_{397}, H_{398}, H_{399}, H_{400}, H_{402}, H_{403}, H_{404}, H_{405}, H_{406}, H_{409}, H_{411}, H_{414}, H_{416}, H_{418}, H_{421}, and H_{424}. Control Group C pupils scored significantly higher on all 10 cognitive variables measured in the spring testing; however, they scored significantly lower on 6 of 21 affective variables and significantly higher on only 1 affective variable.

These findings indicate that whereas Control Group C pupils made significant gains on the cognitive variables during the seventh grade, there were significant decreases in scores on some of the affective variables measured.

Note. For a summative portrayal of significant main effects and significant interactions among treatment groups, intelligence levels, and socio-economic levels, the reader is referred to Appendix K; and for a summative portrayal of significant gain scores between the fall and the spring testing of the Experimental Group and each of the three control groups, the reader is referred to Appendix L. These two appendices graphically depict the major findings of this study. The only phase of this study not portrayed in this manner is the comparison of fall-spring gain scores of the Experimental Group and those of the three control groups following the statistical equating of all four groups through covariance procedures. Since there were only one main effect and three interactions resulting from this phase of the study, the investigators determined that the tabular format used for the other two phases of the study was not needed.

Conclusions

The primary purpose of this study was to determine the relative effectiveness of a non-graded approach to elementary schooling by comparing the cognitive development and the affective development of certain pupils who had had six years of non-graded schooling with those of pupils who had had six years of traditional graded schooling. Pupils from a non-graded school performed as well as or even slightly higher than their graded peers in basic skills development and in other aspects of cognitive growth. Graded pupils, however, had some slight advantage affectively. In all, this study has revealed only minimal differences in either cognitive or affective development at the beginning of the seventh grade among pupils who had attended non-graded and graded elementary schools for six years.

This study does not support claims for the superiority of either non-graded or graded schooling as to total effectiveness. It suggests that equally effective instruction can be provided in different types of administrative and curricula settings. The findings do indicate, however, that certain traditional practices, such as report cards, retention and promotion, and homework, do not contribute positively to either cognitive or affective growth.

The second major purpose of the study was to determine whether any differences found at the end of six years of elementary schooling remained after both non-graded and graded pupils had been exposed to a full year in the seventh grade of traditional junior high schools. Since few differences were found upon entry into the seventh grade, it was likely that few would emerge during the seventh grade. This study, in fact, revealed that the pupils who had attended non-graded and graded elementary schools tended to become more alike during the seventh grade. The only differences that should be considered are in the area of reading and verbal cognitive development, in which the non-graded pupils appeared to be more advanced than some of their graded peers at the end of the seventh grade.

Whereas this study has indicated that non-graded and graded instruction appear to be equally effective for most elementary pupils and that pupils from either type of elementary school can perform satisfactorily in the seventh grade, there are several additional conclusions which may be drawn from the vast array of data gathered, as follows:

1. Socio-economic levels as they relate to this study appear to have no consistent and meaningful effect upon either the cognitive or the affective development of non-graded or graded pupils.

2. Intelligence levels, however, appear to be significantly related to the relative effectiveness of both non-graded and graded instruction.

Essentially, according to this study, lower-IQ pupils who attended a non-graded elementary school liked school better and felt more positively toward grown-ups than lower-IQ graded pupils upon entry into the seventh grade. The positive feelings of the lower-IQ pupils toward grown-ups remained through the seventh grade although their positive attitudes toward school were attenuated. They gained more positive attitudes toward their homes and became more sensitive to their surroundings.

Higher-IQ non-graded pupils had less positive attitudes toward school and were less aware of themselves as members of groups than higher-IQ control pupils. They also had, at the end of the seventh grade, less positive attitudes toward their homes and grown-ups and were less sensitive to their surroundings than lower-IQ non-graded pupils.

It appears that lower-IQ pupils profit more affectively from non-graded elementary schooling while higher-IQ pupils profit more from graded instruction.

3. During the seventh grade pupils from the Experimental Group and from each of the three control groups experienced significant cognitive growth in virtually all areas measured (general intelligence; verbal, quantitative, and non-verbal ability; reading; mathematics; language arts; and spelling). Each group, however, appeared to experience some loss of affective well-being during the seventh grade. At the end of the seventh grade, the Experimental Group scored lower on 10 of 21 affective variables than they had scored at the beginning of the seventh grade; Control Group A, lower on four affective variables; Control Group B, lower on seven affective variables; and Control Group C, lower on six affective variables. Of the four groups, the Experimental Group appeared to be the most adversely affected.

All groups appeared to experience some loss of locus of control within themselves during the seventh grade, and therefore to feel less able to control their own destinies. All groups had more negative attitudes toward homework. Three of four groups had less positive attitudes toward grown-ups. Also, three of four groups had become more dependent (less independent).

Discussion

This study, although meticulously executed, has been conducted within the framework of certain limitations described previously. These limitations as well as several other factors should be considered by those who read and interpret this report.

The investigators used appropriate and robust statistical techniques in all phases of the study. Even more important, extremely stringent procedures were used for selecting the control groups. Control Group A, the matched-pairs group, was so much like

the Experimental Group as to tend to preclude the emergence of differences in the data unless such differences were highly significant.

It should also be recalled that all pupils in the study were from two of five socio-economic levels, according to Hollingshead's classifications. Limited diversity as to socio-economic levels, therefore, did not allow the investigators to explore fully the relationships between socio-economic levels and the variables addressed by the study.

The investigators believe that a possible Hawthorne effect was eliminated by use of an ex post facto design. Since the control pupils were not selected until they reached the seventh grade, there was no way that either the non-graded or graded pupils could have been explicitly or implicitly favored during their elementary schooling. The control pupils were selected from 21 different elementary schools, and the seventh-grade phase of the study was conducted in six different junior high schools. Therefore, any particular advantages or disadvantages of any particular teacher or school curriculum tended to be randomized.

Questions have been raised as to whether the non-graded pupils received preferential treatment since they attended a demonstration school. Actually, the reverse might have been true. These pupils did not move into their school until they were well into their first year. The faculty were unfamiliar with non-graded procedures and therefore less secure in their roles than other faculties. The school program was frequently interrupted by visitors. The curriculum was an emergent one, actually developed as the pupils went through it. The faculty devoted their primary attention to reading and mathematics. The Demonstration School building is a temporary structure which cost approximately one third as much as a neighboring graded school completed at approximately the same time and offering the latest in modern conveniences. For these reasons, and others, the researchers do not believe that the Experimental pupils had significant advantages over the graded pupils in the study.

In addition to these considerations, certain factors relative to the non-graded and graded curricula evaluated should be noted. As stated above, some non-graded procedures were in effect in the 21 graded schools from which control pupils were selected. Also, the type of non-gradedness employed at the Chesapeake Demonstration School included systems approaches to reading and mathematics which encouraged mastery learning of basic skills. In other words, the graded schools in this study were not rigidly traditional; and the non-graded school in this study was not an open or free school. Basics were stressed. The most notable differences between the two types of schools were the absence of marks, report cards, promotions

and retentions, and homework in the non-graded school.

The attitudes of the parents of the non-graded and graded pupils should also be considered. Since the Chesapeake Demonstration School was a demonstration project, the parents of pupils attending that school harbored some fears as to whether their children were being sufficiently schooled in the basic skills. It is quite likely that these fears were internalized by the pupils themselves. If such were the case, then the decrease in affective well-being, noted in the seventh grade among the Experimental pupils, might be in part explained. If one does not expect to do so well as someone else, he is far less likely to do so than if he has more positive feelings as to his adequacy. Brighter pupils were apparently quite self-conscious when they were graded for the first time.

That the lower-IQ pupils in this study appeared to profit more affectively from the non-threatening environment of the non-graded school might have been predicted. Success was possible and failure quite unlikely to occur. The lower-IQ pupils were apparently reinforced affectively by their success. On the other hand, that higher-IQ pupils appeared to profit less affectively from the non-graded environment is not easily explained. This finding is one which should be carefully scrutinized. It may be that the self-confidence of these pupils had already been threatened when this study was conducted at the beginning of the seventh grade because they were among peers from graded schools and were already competing with them for grades. Also, parent fears were particularly high for this group.

The general findings of this study are relatively in accord with those of earlier studies. It should be recalled that eight of 22 research studies reviewed reported positive findings in terms of pupil achievement when non-graded schools were compared with graded schools. Nine studies reported no differences in cognitive variables studied, and five studies reported mixed findings as to cognitive variables. Only one study cited advantages for non-graded schooling in the affective domain, while five studies reported no differences in this area. This study, then, like those of other researchers who have wished to determine the relative effectiveness of non-graded and graded schooling has revealed some findings among cognitive variables that suggest a slight advantage for non-graded pupils, but essentially no advantage in the affective domain. This study supports the efficacy of non-graded schools as an alternative to graded schools; for if non-graded pupils did not exceed their graded peers, at least they achieved as well and were essentially as well developed affectively.

Recommendations

The findings of this study and the conclusions which appear to be warranted relative to them encourage the investigators to make the following suggestions and/or recommendations:

1. Educators involved in non-graded elementary schooling should gain confidence in the efficacy of this type of schooling. It appears to be as effective, if not more effective, than graded schooling in promoting cognitive development. (Children can learn without being graded or threatened with failure.) This confidence should be engendered in the parents of pupils attending non-graded schools and, more importantly, in the pupils themselves.

2. Less able students appear to profit significantly in many affective dimensions from non-graded schooling; therefore, consideration should be given to extending opportunities for less able pupils to attend non-graded schools or to have the benefit of non-graded procedures. Marks appear to have a deleterious effect upon these pupils and should be reconsidered as a means for motivating them and reporting their progress to their parents. Non-graded schools may be an answer to a need long unmet by educators--that is, providing maximum educational opportunities for all the children of all the people, including pupils who are slower learners.

3. Brighter pupils attending non-graded schools appear to need special consideration and assistance that will promote the development of their self-confidence--such as more competition, recognition, external rewards, etc. It also may be that junior-high teachers need assistance in meeting the affective needs of such pupils at the junior-high level.

4. Elementary and junior-high schools should make renewed efforts to provide for a smooth transition to the junior-high milieu. It may be, for example, that additional counseling services in elementary schools are needed to prepare pupils for assuming the responsibilities placed upon them in larger and more complex environments typically found in junior high schools and in some middle schools.

5. Most elementary schools are currently using some type of non-graded procedures--i.e., individualized instruction, grouping, etc. Research as to the effectiveness of many specific aspects of non-graded procedures and their respective effect upon pupils of varying ages, abilities, personalities, learning styles, etc., is lacking, however. This study and others support the efficacy of non-graded schooling; however, further research efforts are needed to determine for which pupils and under what circumstances non-graded procedures are most productive.

Bibliography

Related Research

Anastasiow, N.J. A comparison of two approaches in ungrading reading instruction. Elementary English, 1968, 45, 495-499.

Bockrath, B.M. An evaluation of the ungraded primary as an organizational device for improving learning in St. Louis Archdiocesan Schools. (Doctoral Dissertation, St. Louis University) Ann Arbor, Michigan: University Microfilms, 1959, No. 59-888.

Bowman, B.L. A comparison of pupil achievement and attitude in a graded school with pupil achievement and attitude in a nongraded school 1968-69, 1969-70. (Doctoral Dissertation, University of North Carolina at Chapel Hill, 1971) Ann Arbor, Michigan: University Microfilms, 1971, No. 71-20, 958.

Brody, B.E. Achievement of first- and second-year pupils in graded and nongraded classrooms. Elementary School Journal, 1970, 70, 391-400.

Buffie, G.W. A comparison of mental health and academic achievement: the nongraded school vs. the graded school (Doctoral Dissertation, Indiana University) Ann Arbor, Michigan: University Microfilms, 1962, No. 63-2507.

Carbone, R.F. A comparison of graded and nongraded elementary schools. Elementary School Journal, 1961, 62 (2), 82-88.

Case, D.A. A comparative study of fifth graders in a new middle school with fifth graders in elementary self contained classrooms (Doctoral Dissertation, The University of Florida) Ann Arbor, Michigan: University Microfilms, 1970, No. 71-16,770.

Corbin, J.W. A study of nongraded primary programs in public elementary schools in California. (Doctoral Dissertation, University of the Pacific) Ann Arbor, Michigan: University Microfilms, 1967, No. 67-15,941.

Finley, C., & Thompson, J. A comparison of the achievement of multigraded and single-graded rural elementary school children. Journal of Educational Research, 1963, 56, 471-475.

Halliwell, J.W. A comparison of pupil achievement in graded and nongraded primary classrooms. The Journal of Experimental Education, 1963, 32 (1), 59-63.

Hickey, M.P. An analysis and evaluation of the ungraded primary program in the diocese of Pittsburgh. (Doctoral Dissertation, Fordham University) Ann Arbor, Michigan: University Microfilms, 1962, No. 63-208.

Hillson, M., Jones, J.C., Moore, W., & Van Devender, F. A controlled experiment evaluating the effects of a nongraded organization on pupil achievement. The Journal of Educational Research, 1964, 57 (10), 548-550.

Hopkins, K.D., Oldridge, O.A., & Williamson, M.L. An empirical comparison of pupil achievement and other variables in graded and ungraded classes. American Education Research Journal, 1965, 2 (4), 207-215.

Jones, J.C., Moore, W.J., & Van Devender, F. A comparison of pupil achievement after one and one-half and three years in a nongraded program. The Journal of Educational Research, 1967, 61 (2), 75-77.

Kierstead, R. A comparison and evaluation of two methods of organization for the teaching of reading. Journal of Educational Research, 1963, 56 (6), 317-321.

McLoughlin, W.P. Continuous pupil progress in the nongraded school: hope or hoax? Elementary School Journal, 1970, 71, 90-96.

Morris, V.R., Proger, B.B., & Morrell, J.E. Pupil achievement in a nongraded primary plan after three and five years of instruction. Educational Leadership/Research Supplement, 1971, 4 (5), 621,624.

Ramayya, D.P. Achievement skills, personality variables, and classroom climate in graded and nongraded elementary schools. Psychology in the Schools, 1972, 9, 88-92.

Remacle, L.F. A comparative study of the differences in attitudes, self-concept and achievement of children in graded and nongraded elementary schools. (Doctoral Dissertation, University of South Dakota) Ann Arbor, Michigan: University Microfilms, 1970, No. 71-12649.

Ross, G.A. A comparative study of pupil progress in ungraded and graded primary programs. (Doctoral Dissertation, Indiana University) Ann Arbor, Michigan: University Microfilms, 1967, No. 67-16,428.

Vogel, F.X., & Bowers, N.D. Pupil attitudes, achievement and behavior in a multi-age nongraded school. Project No. 7-8017, EDO 25050, 1968.

Williams, W. Academic achievement in a graded school and in a nongraded school. Elementary School Journal, 1966, 67, 135-139.

Professional References

Ary, D., Jacobs, L., & Razavieh, A. Introduction to research in education. New York: Holt, Rinehart, Winston Inc., 1972.

Barr, A., & Goodnight, J. Statistical analysis system. Raleigh, North Carolina: Student Supply Stores of North Carolina State University, 1972.

Hollingshead, A., & Redlich, F. Social class and mental illness: A community study. New York: John Wiley & Sons, Inc., 1958.

Khatena, J. Attitude patterns as providing validity evidence of "Something About Myself." Perceptual and Motor Skills, 1972, 34, 563-564.

Kirk, R. Experimental design: Procedures for the behavioral sciences. Belmont, California: Brooks/Cole Publishing Co., 1968.

Nowicki, S. & Strickland, B. A locus of control scale for children. Journal of Consulting and Clinical Psychology, 1973, 40 (1), 148-154.

Osgood, C., Suci, G., & Tannenbaum, P. The measurement of meaning. Urbana, Illinois: University of Illinois Press, 1967.

Standardized Tests

Hildreth, G., Griffiths, N., & McGauvran, M. Metropolitan Readiness Tests. New York: Harcourt, Brace, & World, Inc., 1964.

Khatena, J. & Torrance, E. Thinking Creatively with Sounds and Words. Lexington, Massachusetts: Personnel Press, 1973.

Kuhlmann, F. & Anderson, R. Kuhlmann-Anderson Test, Booklet G. Princeton, New Jersey: Personnel Press, Inc., 1960.

Naslund, R., Thorpe, L., & Lefever, W. SRA Achievement Series, multi-level form E/green level. Chicago, Illinois: Science Research Associates, Inc., 1971.

Thorndike, R. & Hagen, E. Cognitive Abilities Test, verbal, non-verbal, and quantitative batteries, form 1, levels A-H. New York: Houghton Mifflin Co., 1971.

Thorpe, L., Clark, W., & Tiegs, E. California Test of Personality. Monterey, California: CTB/McGraw-Hill, 1953.

Ziller, R., Long, B., & Henderson, E. Self-Social Symbols Tasks. Atlanta, Georgia: The Office of Special Tests, Educational Testing Service, 1973.

Appendix A

The Chesapeake Demonstration School

In 1967 the Chesapeake Virginia Public Schools were awarded a Title III Public Law 89-10 grant in excess of $350,000 to establish a primary school in which a number of promising practices in elementary education would be combined to demonstrate the efficacy of non-graded procedures. The original population of the school was composed of five-, six-, and seven-year-old children. The seven-year-old group was the only group who had had previous public-school instruction since there were no provisions at that time for public education for five-year-olds in Chesapeake.

The Chesapeake Primary School was funded for a second year in 1968 with a grant in excess of $400,000. The third-year grant was increased to be in excess of $450,000 since the program had proved to be singularly successful and had attracted the attention of educators from across the United States and from other countries as well.

At the conclusion of the 1968-69 school year, the pupils who had entered the Chesapeake Primary School as seven-year-olds were completing the equivalent of the third grade. It had been anticipated that these children would be transferred to a traditional graded school at that time. There was so much interest on both the state and local levels in extending the school program to include the upper elementary years, however, that the program was expanded accordingly. Hence, the present program provides schooling for children of ages five through eleven. The name of the school has been changed to be the Chesapeake Demonstration School.

No transfer pupils were accepted at the Demonstration School during the first four years of its implementation so that enrollments included pupils who had attended only this school.

Since the systems approach has been employed in this school from its inception, the progress of each child through the curriculum in reading and in mathematics is carefully logged. As specific behavioral objectives are mastered, dated notations are made.

For most behavioral objectives criterion-referenced tests have been developed. Assisting with the development of these instruments have been consultants from Educational Testing Service of Princeton, New Jersey; Dr. Patrick Toole of the Pennsylvania State Department of Education; Dr. Richard Brandt of the University of Virginia; and various members of the Chesapeake Schools' supervisory staff.

To implement the systems oriented non-graded program of the school, such contemporary practices as the following are used: modular scheduling, team teaching, teacher aides, opportunities

for independent study, and direct pupil involvement in as many aspects of the teaching-learning activities as possible.

Two of the most notable characteristics of the school are the absence of any grade designations, including such designations as phases, levels, etc., and the absence of marks and report cards. The continuous progress program of the school notes a child's mastery of a given objective or lack of it and therefore does not lend itself to any type of marking system. Another distinguishing characteristic of the school is that homework is not assigned on a regular basis. Homework is used only as an aspect of individualized instruction where the particular interests and/or needs of given pupils indicate that homework may be helpful.

Pupils enrolled in the school are volunteered by their parents. No pupil is required to attend. Pupils may also be removed from the school at their parents' request. The Chesapeake Demonstration School, like the other schools in Chesapeake, loses a number of pupils each year as families move from the Tidewater, Virginia, area in the course of government related (largely Naval) activities.

Of the 118 pupils who entered the Chesapeake Demonstration School as six-year-olds in 1967, 28 percent, 33 pupils, transferred to other schools in the city, while 20 percent, 24 pupils, transferred from the city. Three percent, 3 pupils, advanced to the junior high school in June, 1972, a year earlier than their peers; and 5 percent, 6 pupils, remained at the Chesapeake Demonstration School for a seventh year. In all, 44 percent, 52 pupils, entered Grade 7 at the Western Branch Junior High School in September, 1973, having completed six years of elementary schooling at the Chesapeake Demonstration School.

The Chesapeake Demonstration School enrollments relative to this study were as follows:

	1967-1968		1972-1973	
	Age Group	Number	Age Group	Number
	5	142	5	96
	*6	118	6	85
	7	103	7	83
Total		363	8	61
			9	66
			10	79

1967-1968		1972-1973	
Age Group	Number	Age Group	Number
		*11	66
		12	4
	Total		540

*The group from which the Experimental pupils in this study were selected were enrolled in the Chesapeake Demonstration School in September, 1967, when they were six years old. They left the Chesapeake Demonstration School at the conclusion of the 1972-1973 school year, at which time they were regarded as the eleven-year-old group.

Appendix B

The Chesapeake, Virginia, Graded Elementary Schools

The 21 graded elementary schools in Chesapeake, which the three control groups for this study attended, were arranged according to various grade levels. There were schools serving pupils from Grades 1-3; from Grades 4-6; from Grades 1-6; as well as other grade distributions. Since the City of Chesapeake covers a large land area, approximately 300 square miles, it is more nearly a series of small communities than a single city in the usual sense. The graded subjects of this study entered elementary school in 1967, with the first-grade enrollment being 2,582, of whom 2,217 attended graded schools, and 363 attended the Chesapeake Demonstration School, which was the only non-graded school in the city.

Each community in Chesapeake is served by elementary schools as needs indicate. School enrollments vary widely from community to community. The largest graded elementary school in 1967 was Portlock Elementary School, with an enrollment of 1,022 pupils; while the smallest was South Hill Elementary School, where the enrollment was only 108 pupils. The oldest elementary school building had been built in 1908, and the newest had been opened in 1966.

The graded elementary schools in Chesapeake were relatively advanced in terms of innovative curricula. The control subjects in this study do not represent pupils from rigidly, graded schools. Both the reading and mathematics programs throughout Chesapeake were, to a degree, non-graded in that efforts were made to provide appropriate instruction for each pupil, particularly in reading and in mathematics.

The Chesapeake developmental reading program was recognized throughout the state as exemplary in many respects. Grouping procedures similar to those popularly known as the Joplin Plan were used through the entire elementary program.

Individualized Mathematics Systems (IMS) was used in a number of the graded elementary schools in Chesapeake. Where IMS was not used, other provisions were made for individualizing instruction in mathematics.

The graded schools in Chesapeake were graded schools, however. Pupils were promoted or retained and were given letter grades at regular intervals except in reading, where they received a grade of pass or fail. Self-contained classrooms were found throughout the school division although there was some departmentalization at the upper elementary levels. The graded elementary schools of Chesapeake tended to represent a productive blend of traditional stability and modern innovations.

All control subjects in this study were selected from 512 pupils who had had six years of graded schooling in Chesapeake and who had entered the seventh grade in September, 1973. Of the 2,217 graded pupils who had entered the first grade in September, 1967, 10 percent, 246 pupils, had been retained at some time during their elementary years and 69 percent, 1,706 pupils, had transferred out of Chesapeake to other school divisions.

Appendix C

The Chesapeake, Virginia, Junior High Schools

There were six junior high schools in Chesapeake in 1973, when this study was begun. The total enrollment in the seventh grade was 2,391 pupils. Typically Grades 7 and 8 were housed in junior-high-school buildings. In Virginia, Grade 7 is regarded as an elementary grade, with Grade 8 being the first of a five-year secondary sequence. In combining Grades 7 and 8 as junior-high-school units, some compromises in Grade 7 are usually needed -- i.e., the seventh-grade curriculum must be tailored to match a six-period day.

The seventh grade in the Chesapeake Schools, which the Experimental and the control-group pupils of this study attended, was a completely departmantalized school program, with pupils enrolled in English, social studies, mathematics, science, and physical education classes. The sixth period of the day was typically available for music, reading, and other selected electives. The English classes were of three types: basic, average, and advanced -- again, representing the efforts of the school division to allow each student to progress through the curriculum at his own pace. There was also some grouping of students for mathematics. The curriculum tended to be the same from school to school because the Chesapeake Public Schools, although geographically separated by wide expanses of communities, were closely organized and supervised by a well-trained and competent central office staff.

Only 24 percent of the total seventh-grade population in 1973, 581 pupils, had attended Chesapeake Schools for their entire elementary schooling and had never been retained. Of these 581 pupils, 201 were white males, 228 were white females, 27 were black males, and 125 were black females. Both the Experimental and the control subjects in this study had received all six years of their elementary schooling in the Chesapeake Public Schools and were enrolled in the seventh grade in one of six junior high schools in that school division as the study was begun.

Appendix D

Analysis of Related Literature

1. Investigator: Anastasiow, N.J. (1968)

Subjects: S's from two schools; Grades 4-6

Experimental Procedures: Reading achievement of non-graded ES's was compared with that of CS's in a graded program, with S's matched as to reading achievement and social class (Hollingshead's Two-Factor Social-Class Index), and teachers matched as to experience and principal's evaluation of competencies.

Dependent Variable:
Sequential Tests of Educational Progress: Reading

Findings: ES's and CS's scored the same.

Comments:
Apparent Weaknesses: N's were not clearly specified. Measures used to match subjects were not clearly specified. Results of the study were not clearly stated.

2. Investigator: Bockrath, B.M. (1959)

Subjects: S's from 50 schools; Grade 4

Experimental Procedures: Reading achievement of ES's in a stratified sample of fourth-graders in 50 schools in 1953 was compared in 1956 with that of CS's, a similar group of fourth-graders, following the introduction of non-graded procedures.

Dependent Variable:
Not cited.

Findings: ES's scored significantly higher on reading achievement tests than CS's.

Comments:

Bockrath, B.M. (con't.)

Apparent Weaknesses: Results were confounded because the age when ES's entered school was not consistent, and the comparability of the many schools and pupils involved is questionable.

3. Investigator: Bowman, B.L. (1971)

Subjects: S's from primary and intermediate grades.

Experimental Procedures: Attitudes, self-concepts, and academic progress of ES's were compared with those of CS's in the 1968-69 and 1969-70 school years, with the Lorge-Thorndike Test of Intelligence as a covariate; and a sampling survey was made of teachers to determine methods used.

Dependent Variables:
Metropolitan Achievement Test
Piers-Harris Children's Self-Concept Scale
Questionnaires

Findings: ES's at the intermediate level scored significantly higher on all achievement tests than CS's; however, ES's and CS's scored the same on a measure of self-concept and attitude toward school, and primary S's tended to score the same on all measures.

Comments:
Apparent Weaknesses: Certain media and other materials were more available for ES's. Differences in methods used were determined only by teacher opinion.

4. Investigator: Brody, B.E. (1970)

Subjects: ES's 362; CS's 241-- Grades 1-2

Experimental Procedures: Achievement of non-graded ES's was compared with that of graded CS's at the end of one and two years, with S's matched by sub-samples as to IQ (California Test of Mental Maturity-S Form)

Brody, B.E. (con't.)

Dependent Variable:
Stanford Achievement Test

Findings: ES's scored significantly higher on six of ten subtests with apparently significant interaction occurring between organizational structure and IQ--i.e., first-grade lower IQ ES's and second-grade higher IQ ES's benefitted most from the non-graded program.

Comments;
Apparent Strengths: A large N was used.

Apparent Weaknesses: ANOVA was not used to study interaction effects, which are implied in the report of results.

5. Investigator: Buffie, G.W. (1962)

Subjects: ES's 117; CS's 117-- Primary grades.

Experimental Procedures: Achievement, mental health, and personality development of randomly selected ES's from four equated (SES, enrollment, class size, teacher training and experience) non-graded schools were compared with those of CS's from four equated graded schools, with CS's matched with ES's on the basis of sex, age, and IQ.

Dependent Variables:
The Iowa Tests of Basic Skills
The California Test of Personality
The Test Anxiety Scale for Children
The General Anxiety Scale for Children

Findings: ES's scored significantly higher on achievement and mental health adjustment.

Comments:
Apparent Weaknesses: Groups may not have been equated sufficiently as to ability and achievement of pupils. Criteria for designating non-graded schools were not clearly specified.

6. Investigator: Carbone, R.F. (1961)

Subjects: ES's 122; CS's 122-- Grades 4-6

Experimental Procedures: Mental health and school achievement of non-graded ES's were compared with those of graded CS's, with S's matched as to sex and age.

Dependent Variables:
Iowa Tests of Basic Skills
Mental Health Analysis (California Test Bureau)
Semantic Differential Technique

Findings: ES's scored higher on all achievement tests and on a test of social participation, and they also described their teachers more positively than CS's; but ES's did not score higher on other mental health measures.

Comments:
Apparent Strengths: A teacher survey to ascertain the degree of non-gradedness of given programs added clarity to use of the terms non-graded and graded.

Apparent Weaknesses: Matching criteria were limited. Methods for assigning teachers to treatment groups were not specified. The time span of the experimental treatment was not specified.

7. Investigator: Case, D.A. (1970)

Subjects: ES's 131; CS's 138-- Grade 5

Experimental Procedures: Achievement, self-concept, attitudes toward school, and social acceptance among peers of non-graded ES's were compared with those of graded CS's at the end of one year, with schools having similar student bodies in terms of social, economic, cultural, and community factors.

Dependent Variables:
Stanford Achievement Test
How I See Myself
Ohio Social Acceptance Scale

Case, D.A. (con't.)

Findings: ES's and CS's scored the same on all measures.

Comments:

Apparent Strengths: Curricula were well defined.

Apparent Weaknesses: Matching criteria were limited. The study was in effect for only one year. ANOVA was not used to study interactions.

8. Investigator: Corbin, J.W. (1967)

Subjects: Principals, teachers, parents, and pupils in 28 school districts.

Experimental Procedures: Reading and arithmetic achievement of pupils in non-graded schools was compared with that of pupils in graded schools.

Dependent Variable:
Questionnaires

Findings: A majority of the school districts reported higher mathematics and reading achievement in non-graded schools, while no respondent reported lower achievement in non-graded schools.

Comments:

Apparent Weaknesses: Criteria for designating non-graded schools were not specified. The survey technique used was not adequately described.

9. Investigator: Finley, C.J. (1963)

Subjects: ES's 104; CS's 104-- Grade 3
ES's 108; CS's 108-- Grade 5

Experimental Procedures: Achievement of ES's in 28 non-graded rural elementary schools was compared with that of CS's in 33 graded rural elementary schools, at the

Finley, C.J. (con't.)

end of two years (Grade 3) and of three years (Grade 5), with S's matched one-to-one by sex, IQ within five points (California Test of Mental Maturity-S Form), age within three months, and time of participation in school testing program.

Dependent Variable:
California Achievement Test Battery

Findings: ES's and CS's scored the same on all achievement measures.

Comments:
Apparent Strengths: Careful application of matched-pairs procedures in selecting ES's and CS's was employed.

Apparent Weaknesses: Review of the literature was not current.

10. Investigator: Halliwell, J.W. (1963)

Subjects: ES's 146; CS's 149 --Grades 1-3

Experimental Procedures: Reading achievement (vocabulary and comprehension) and spelling achievement of ES's in a non-graded primary program for one year were compared with those of CS's who had attended a traditional program in the same school the year before.

Dependent Variables:
California Achievement Tests
Metropolitan Achievement Test
Lorge-Thorndike Intelligence Test

Findings: First-grade ES's scored higher on word knowledge and reading comprehension than CS's; second-grade ES's scored higher on arithmetic; and third-grade ES's scored higher on computation and problem-solving.

Comments:
Apparent Weaknesses: No evidence was provided as to whether (or how) groups were equated. Treatment

Halliwell, J.W. (con't.)

was in effect for only eight months. Some unplanned curriculum changes occurred.

11. Investigator: Hickey, M.P. (1962)

Subjects: ES's 746; CS's 606--Grades 1-3 in 14 schools.

Experimental Procedures: Reading and arithmetic achievement and personal adjustment of non-graded ES's were compared with those of graded CS's at the end of three years.

Dependent Variable:
Not cited.

Findings: ES's scored significantly higher on reading and arithmetic achievement tests, with high IQ ES's benefitting the most; but there was no difference in personal adjustment.

Comments:

Apparent Strengths: ANOVA was used to study interaction effects. A large N was used.

Apparent Weaknesses: Methods for assigning CS's to treatment groups were not clearly specified.

12. Investigators: Hillson, M.; Jones, J.C.; Moore, W.J.; Van Devender, F. (1964)

Subjects: ES's 26; CS's 26--Grades 1-3

Experimental Procedures: Reading achievement (vocabulary development and comprehension) of non-graded ES's, randomly assigned, was compared to that of graded CS's at the end of three years.

Dependent Variables:
Lee-Clark Reading Test
Stanford Achievement Test: Paragraph Meaning, Word Meaning

..illson, M., et al. (con't.)

Findings: ES's scored significantly higher on both achievement tests.

Comments:

Apparent Strengths: S's and teachers were randomly assigned to treatment groups.

Apparent Weaknesses: Hawthorne effect may have been present.

13. Investigators: Hopkins, K.D.; Oldridge, O.A.; Williamson, M.L. (1965)

Subjects: 20 ungraded classrooms; 25 graded classrooms--primary grades

Experimental Procedures: Reading (vocabulary and comprehension), teacher satisfaction, socio-metric patterns, and attendance of non-graded ES's were compared with those of graded CS's at the end of three years.

Dependent Variable:

California Reading Test

Findings: ES's and CS's scored the same on the reading test, there were no differences in teacher satisfaction, sociometric patterns, or pupil attendance. Graded girls scored significantly higher on all three reading measures; however, no significant interactions were associated with IQ or sex.

Comments:

Apparent Strengths: A Hawthorne effect was avoided since teachers were unaware of research activities. Non-significant interactions were explained. A large N was used.

Apparent Weaknesses: Neither S's nor teachers were randomly assigned to treatment groups although reading readiness scores of ES's and CS's (Lee-Clark Reading Readiness Test) were examined and no significant differences were found.

14. Investigators: Jones, J.C.; Moore, W.J.; Van Devender, F. (1967)

Subjects: ES's 26 ; CS's 26--Grades 1-3

Experimental Procedures: Reading achievement (vocabulary and comprehension) of non-graded ES's and graded CS's, randomly assigned, was compared at the end of three years.

Dependent Variables;
Lee-Clark Reading Test
Stanford Achievement Test: Paragraph Meaning, Word Meaning
California Achievement Test: Reading, Language Arts

Findings: ES's scored significantly higher after one and one-half years on all achievement tests, but not after three years.

Comments:
Apparent Strengths: S's and teachers were randomly assigned to treatment groups.

Apparent Weaknesses: A Hawthorne effect may have been present in the initial phases of the study.

15. Investigator: Kierstead, R. (1963)

Subjects: S's from one school --Grades 3-8

Experimental Procedures: Reading achievement of non-graded ES's was compared with that of graded CS's, with S's matched as to achievement (Iowa Tests of Basic Skills) and IQ (Pintner General Ability Test--Non Verbal).

Dependent Variables:
Iowa Tests of Basic Skills
Pintner General Ability Test--Non-Verbal

Findings: ES's and CS's scored the same on both instruments.

Comments:
Apparent Weaknesses: Matching criteria were limited to achievement and an IQ score. N's were not given other than in tables, where they varied according to data portrayed.

16. Investigator: McLoughlin, W.P. (1970)

Subjects: 17 elementary schools--primary grades.

Experimental Procedures: Promotions of S's in three types of non-graded programs (organized according to three different grouping plans and existing for one to seven years) were compared.

Dependent Variable:
Percentage of promotions

Findings: Percentage of promotions was the same for all S's in each of three non-graded programs.

Comments:
Apparent Strengths: A large N (thousands of students and hundreds of teachers) was used.

Apparent Weaknesses: Methods for assigning S's to groups and promotion criteria were not clearly specified.

17. Investigators: Morris, V.R.; Proger, B.B.; Morrell, J.E. (1971)

Subjects: ES's 57; CS's 60-- Grades 1-5

Experimental Procedures: Achievement of non-graded ES's randomly assigned was compared at the end of three and five years with that of graded CS's assigned on the basis of age.

Dependent Variables:
Iowa Tests of Basic Skills (end of third year)
Stanford Achievement Test (end of fifth year)

Findings: ES's scored significantly higher on achievement tests at the end of both three and five years.

Comments:
Apparent Strengths: Both primary and upper-elementary CS's were included. Covariance was used to equate the groups statistically and to examine possible interaction effects.

Morris, V.R., et al. (con't.)

Apparent Weaknesses: ES's being randomly assigned and CS's being assigned on the basis of age is a questionable procedure. Specific scores on subtests and subsequent significances thereof were not given in reporting results.

18. Investigator: Ramayya, D.P. (1972)

Subjects: ES's 80; CS's 80 --Grade 6

Experimental Procedures: Reading and mathematics achievement as well as various affective factors of non-graded ES's were compared with those of graded CS's at the end of six years, with S's matched one-to-one as to sex, IQ, and SES.

Dependent Variables:
Self-Esteem Inventory
Sentence Completion Test for Measuring Ego Development
My Class Inventory

Findings: Male ES's scored significantly higher than male CS's on reading achievement tests and showed more self-esteem, but functioned with less satisfaction and intimacy than male CS's. Male ES's showed no significant differences in mathematics scores or in other personality variables. Female ES's scored significantly higher than female CS's in mathematics problem-solving ability but in no other achievement or personality trait measured.

Comments:

Apparent Strengths: ES's and CS's were matched one-to-one on three factors (sex, age, and SES).

Apparent Weaknesses: Criteria for designating a program as non-graded were not specified.

19. Investigator: Remacle, L.F. (1970)

Subjects: ES's 64; CS's 64 --Grades 5-6

Remacle, L.F. (con't.)

Experimental Procedures: Achievement, attitudes, and self-concept of non-graded ES's were compared with those of graded CS's.

Dependent Variables:
Iowa Tests of Basic Skills
School Morale Scale
Index of Adjustment and Values

Findings: ES's and CS's scored the same on achievement tests in both Grades 5 and 6, except on the Work Study Skills subtest, on which sixth-grade ES's scored significantly higher. ES's in Grade 5 evidenced more positive attitudes toward school, with no differences in attitudes in Grade 6 or in self-concept in either grade.

Comments:
Apparent Weaknesses: Methods for assigning S's to treatment groups were not clearly specified, and length of assignment (one or two years) was not stated.

20. Investigator: Ross, G.A. (1967)

Subjects: ES's 128; CS's 164 -- Primary grades

Experimental Procedures: Academic achievement, mental health, and social relationships of non-graded ES's were compared with those of graded CS's at the end of one year, with S's matched as to IQ (California Test Of Mental Maturity-S Form) and pretested with the Metropolitan Achievement Tests, Test of Anxiety Scale for Children, and a socio-metric measure.

Dependent Variables:
Metropolitan Achievement Tests
Test Anxiety Scale for Children
Socio-metric measures

Findings: ES's and CS's scored the same on all measures.

Comments:
Apparent Strengths: A large N was used.

Ross, G.A. (con't.)

Apparent Weaknesses: The study was in effect for only six months.

21. Investigators: Vogel, F.X.; Bowers, N.D. (1968)

Subjects: S's 707 --Grades 1-6

Experimental Procedures: Achievement(performance during a group situation), classroom behavior, attitudes, and conceptual maturity of non-graded ES's were compared at the end of one year with those of randomly-assigned graded CS's, identified as of normal age, underage, and of average age.

Dependent Variables:
Stanford Achievement Test
Russell Sage Social Relations Test: Planning, Operations Contributing, Operations Non-Contributing
Observation Schedule and Record: Contributing, Non-Contributing

Findings: ES's scored higher on the achievement test, evidenced greater conceptual maturity, participated in more group activities and evidenced more positive attitudes toward school than CS's.
Significant differences across age groups in achievement, group planning, group operation, and conceptual maturity were found--favoring underage pupils.

Comments:
Apparent Strengths: Terms used, such as non-graded, were clearly defined. Data were collected by psychometrists. Elaborate tables depicted data graphically. Sophisticated univariate and multivariate statistical procedures were employed to analyze data gathered.

Apparent Weaknesses: Criteria for designation of groups, including N's,were not clearly specified. Lack of clarity in reporting results severely limits interpretation of this study.

22. Investigator: Williams, W. (1966)

Subjects: ES's 38; CS's 38--Grade 3

Experimental Procedures: Achievement of non-graded ES's was compared with that of graded CS's at the end of three years, with S's matched as to age, sex, and IQ.

Dependent Variable:
Stanford Achievement Test

Findings: ES's and CS's scored the same except on the Paragraph Meaning Subtest, on which CS's scored higher. Overall, higher achieving ES's benefited more from the non-graded program than lower achievers, while lower-achievers benefitted more from the graded program. There were no significant differences among scores of female ES's and CS's, and none for males, except on the Work Study Skills subtest, on which male CS's scored higher.

Comments:

Apparent Strengths: ES's and CS's were matched one-to-one on three factors (age, sex, and IQ).

Apparent Weaknesses: Non-graded teachers averaged 18 more S's per class than graded teachers. Statistical analysis involving t procedures are not adequate for making multiple comparisons and/or investigating interactions.

Appendix E

The City of Chesapeake, Virginia

The City of Chesapeake, Virginia, the state's second largest city in land area, approximately 300 square miles, is situated in the southeastern portion of Tidewater Virginia's coastal plain about 90 air miles southeast of Richmond. It is surrounded by the cities of Norfolk and Portsmouth to the north, the city of Virginia Beach to the east, the North Carolina line to the south, and the city of Suffolk to the west. According to the 1970 census, the population of Chesapeake was 89,580.

In general, the population is a youthful population, with only 21.4 percent of the people being 45 years of age or older. The percentage of non-white residents in 1971 was 23.7 percent.

The primary industries in Chesapeake are manufacturing and agriculture although a number of persons living in Chesapeake work in adjacent cities, particularly on government installations such as the Norfolk Naval Shipyard.

Chesapeake has been described as a largely suburban community; however, it should not be inferred that it is an affluent suburban community. Its citizens are largely blue-collar workers who work in the greater Norfolk, Virginia, area. The more affluent Tidewater suburbs are closer to the ocean in such communities as Virginia Beach.

A recent survey conducted by the Governor of Virginia suggested that the average years of schooling completed by the adults in Chesapeake was nine years as compared to, for example 11 years in Virginia Beach, a neighboring city. The citizens of Chesapeake, however, have a tradition of being substantially interested in and supportive of the public schools. Across the state, the Chesapeake Public Schools are recognized as one of the leading school divisions in terms of openness to new ideas and willingness to move forward toward incorporating the most promising of these ideas into school curricula.

The wealth per child in Chesapeake, based on 1970 values of real estate and public services, was $25,523, placing Chesapeake below the state average of $32,932 and giving Chesapeake a ranking of 29 among 36 cities in Virginia. The total yearly expenditure per pupil during the 1972-73 school year was $689, a figure well below the average expenditure among the cities of the state, which was $851.

Although Chesapeake has had a lower tax base and a more modest school budget than many of the other cities in the state, it has been productive in a number of ways -- including the attainment of a better-than-state-average number of graduates entering institutions of higher education. In the 1972-73 school

year 59 percent of the total graduates from Chesapeake schools attended college, whereas the state average among all cities was 48.7 percent. Chesapeake's determined effort to educate its young is also evident in a low drop-out rate—i.e., 4.5 percent in the 1972-73 school year as compared to the state average of 5.6 percent.

Appendix F

Nowicki-Strickland Scale

Circle the word yes or no to represent your answer to each of the following questions:

1.	Do you believe that most problems will solve themselves if you just don't fool with them?	Yes	No
2.	Do you believe that you can stop yourself from catching a cold?	Yes	No
3.	Are some kids just born lucky?	Yes	No
4.	Most of the time do you feel that getting good grades means a great deal to you?	Yes	No
5.	Are you often blamed for things that just aren't your fault?	Yes	No
6.	Do you believe that if somebody studies hard enough he or she can pass any subject?	Yes	No
7.	Do you feel that most of the time it doesn't pay to try hard because things never turn out right anyway?	Yes	No
8.	Do you feel that if things start out well in the morning that it's going to be a good day no matter what you do?	Yes	No
9.	Do you feel that most of the time parents listen to what their children have to say?	Yes	No
10.	Do you believe that wishing can make good things happen?	Yes	No
11.	When you get punished does it usually seem it's for no good reason at all?	Yes	No
12.	Most of the time do you find it hard to change a friend's (mind) opinion?	Yes	No

13. Do you think that cheering more than luck helps a team to win? Yes No

14. Do you feel that it's nearly impossible to change your parent's mind about anything? Yes No

15. Do you believe that your parents should allow you to make most of your own decisions? Yes No

16. Do you feel that when you do something wrong there's very little you can do to make it right? Yes No

17. Do you believe that most kids are just born good at sports? Yes No

18. Are most of the other kids your age stronger than you are? Yes No

19. Do you feel that one of the best ways to handle most problems is just not to think about them? Yes No

20. Do you feel that you have a lot of choice in deciding who your friends are? Yes No

21. If you find a four leaf clover do you believe that it might bring you good luck? Yes No

22. Do you often feel that whether you do your homework has much to do with what kind of grades you get? Yes No

23. Do you feel that when a kid your age decides to hit you, there's little you can do to stop him or her? Yes No

24. Have you ever had a good luck charm? Yes No

25. Do you believe that whether or not people like you depends on how you act? Yes No

26. Will your parents usually help you if you ask them to? Yes No

27. Have you felt that when people were mean to you it was usually for no reason at all? Yes No

28. Most of the time, do you feel that you can change what might happen tomorrow by what you do today? Yes No

29. Do you believe that when bad things are going to happen they just are going to happen no matter what you try to do to stop them? Yes No

30. Do you think that kids can get their own way if they just keep trying? Yes No

31. Most of the time do you find it useless to try to get your own way at home? Yes No

32. Do you feel that when good things happen they happen because of hard work? Yes No

33. you feel that when somebody your age wants to be your enemy there's little you can do to change matters? Yes No

34. Do you feel that it's easy to get friends to do what you want them to? Yes No

35. Do you usually feel that you have little to say about what you get to eat at home? Yes No

36. Do you feel that when someone doesn't like you there's little you can do about it? Yes No

37. Do you usually feel that it's almost useless to try in school because most other children are just plain smarter than you are? Yes No

38. Are you the kind of person who believes that planning ahead makes things turn out better? Yes No

39. Most of the time, do you feel that you have little to say about what your family decides to do? Yes No

40. Do you think it's better to be smart than to be lucky? Yes No

Appendix G

Semantic Differential

Report Form

NAME_____

DATE_____

Listen carefully as the instructions for this test are read to you.

Sample Item

SNOW

	very	sort of	neither	sort of	very	
UNPLEASANT	_____	_____	_____	_____	_____	PLEASANT
GOOD	_____	_____	_____	_____	_____	BAD

Semantic Differenital (con't.)

MY SCHOOL

	very	sort of	neither	sort of	very	
GOOD	_____	_____	_____	_____	_____	BAD
UNFRIENDLY	_____	_____	_____	_____	_____	FRIENDLY
KIND	_____	_____	_____	_____	_____	CRUEL
HONEST	_____	_____	_____	_____	_____	DISHONEST
NEGATIVE	_____	_____	_____	_____	_____	POSITIVE
UNGRATEFUL	_____	_____	_____	_____	_____	GRATEFUL
WILLING	_____	_____	_____	_____	_____	UNWILLING
BEAUTIFUL	_____	_____	_____	_____	_____	UGLY
FOOLISH	_____	_____	_____	_____	_____	WISE
IMPORTANT	_____	_____	_____	_____	_____	UNIMPORTANT
LOW	_____	_____	_____	_____	_____	HIGH
UNSUCCESSFUL	_____	_____	_____	_____	_____	SUCCESSFUL

Semantic Differential (con't.)

MATH AND SCIENCE ACTIVITIES

	very	sort of	neither	sort of	very	
UNIMPORTANT	_____	_____	_____	_____	_____	IMPORTANT
WISE	_____	_____	_____	_____	_____	FOOLISH
UGLY	_____	_____	_____	_____	_____	BEAUTIFUL
BAD	_____	_____	_____	_____	_____	GOOD
FRIENDLY	_____	_____	_____	_____	_____	UNFRIENDLY
POSITIVE	_____	_____	_____	_____	_____	NEGATIVE
UNWILLING	_____	_____	_____	_____	_____	WILLING
DISHONEST	_____	_____	_____	_____	_____	HONEST
HIGH	_____	_____	_____	_____	_____	LOW
CRUEL	_____	_____	_____	_____	_____	KIND
SUCCESSFUL	_____	_____	_____	_____	_____	UNSUCCESSFUL
GRATEFUL	_____	_____	_____	_____	_____	UNGRATEFUL

Semantic Differential (con't.)

MY HOME

	very	sort of	neither	sort of	very	
GOOD	_____	_____	_____	_____	_____	BAD
UNFRIENDLY	_____	_____	_____	_____	_____	FRIENDLY
KIND	_____	_____	_____	_____	_____	CRUEL
HONEST	_____	_____	_____	_____	_____	DISHONEST
NEGATIVE	_____	_____	_____	_____	_____	POSITIVE
UNGRATEFUL	_____	_____	_____	_____	_____	GRATEFUL
WILLING	_____	_____	_____	_____	_____	UNWILLING
BEAUTIFUL	_____	_____	_____	_____	_____	UGLY
FOOLISH	_____	_____	_____	_____	_____	WISE
IMPORTANT	_____	_____	_____	_____	_____	UNIMPORTANT
LOW	_____	_____	_____	_____	_____	HIGH
UNSUCCESSFUL	_____	_____	_____	_____	_____	SUCCESSFUL

Semantic Differential (con't.)

READING AND LANGUAGE ARTS (ENGLISH ACTIVITIES)

	very	sort of	neither	sort of	very	
UNIMPORTANT	_____	_____	_____	_____	_____	IMPORTANT
WISE	_____	_____	_____	_____	_____	FOOLISH
UGLY	_____	_____	_____	_____	_____	BEAUTIFUL
BAD	_____	_____	_____	_____	_____	GOOD
FRIENDLY	_____	_____	_____	_____	_____	UNFRIENDLY
POSITIVE	_____	_____	_____	_____	_____	NEGATIVE
UNWILLING	_____	_____	_____	_____	_____	WILLING
DISHONEST	_____	_____	_____	_____	_____	HONEST
HIGH	_____	_____	_____	_____	_____	LOW
CRUEL	_____	_____	_____	_____	_____	KIND
SUCCESSFUL	_____	_____	_____	_____	_____	UNSUCCESSFUL
GRATEFUL	_____	_____	_____	_____	_____	UNGRATEFUL

Semantic Differential (con't.)

GROWNUPS

	very	sort of	neither	sort of	very	
GOOD	_____	_____	_____	_____	_____	BAD
UNFRIENDLY	_____	_____	_____	_____	_____	FRIENDLY
KIND	_____	_____	_____	_____	_____	CRUEL
HONEST	_____	_____	_____	_____	_____	DISHONEST
NEGATIVE	_____	_____	_____	_____	_____	POSITIVE
UNGRATEFUL	_____	_____	_____	_____	_____	GRATEFUL
WILLING	_____	_____	_____	_____	_____	UNWILLING
BEAUTIFUL	_____	_____	_____	_____	_____	UGLY
FOOLISH	_____	_____	_____	_____	_____	WISE
IMPORTANT	_____	_____	_____	_____	_____	UNIMPORTANT
LOW	_____	_____	_____	_____	_____	HIGH
UNSUCCESSFUL	_____	_____	_____	_____	_____	SUCCESSFUL

Semantic Differential (con't.)

MY CLASSMATES

	very	sort of	neither	sort of	very	
GOOD	_____	_____	_____	_____	_____	BAD
UNFRIENDLY	_____	_____	_____	_____	_____	FRIENDLY
KIND	_____	_____	_____	_____	_____	CRUEL
HONEST	_____	_____	_____	_____	_____	DISHONEST
NEGATIVE	_____	_____	_____	_____	_____	POSITIVE
UNGRATEFUL	_____	_____	_____	_____	_____	GRATEFUL
WILLING	_____	_____	_____	_____	_____	UNWILLING
BEAUTIFUL	_____	_____	_____	_____	_____	UGLY
FOOLISH	_____	_____	_____	_____	_____	WISE
IMPORTANT	_____	_____	_____	_____	_____	UNIMPORTANT
LOW	_____	_____	_____	_____	_____	HIGH
UNSUCCESSFUL	_____	_____	_____	_____	_____	SUCCESSFUL

Semantic Differential (con't.)

ART AND MUSIC ACTIVITIES

	very	sort of	neither	sort of	very	
UNIMPORTANT	_____	_____	_____	_____	_____	IMPORTANT
WISE	_____	_____	_____	_____	_____	FOOLISH
UGLY	_____	_____	_____	_____	_____	BEAUTIFUL
BAD	_____	_____	_____	_____	_____	GOOD
FRIENDLY	_____	_____	_____	_____	_____	UNFRIENDLY
POSITIVE	_____	_____	_____	_____	_____	NEGATIVE
UNWILLING	_____	_____	_____	_____	_____	WILLING
DISHONEST	_____	_____	_____	_____	_____	HONEST
HIGH	_____	_____	_____	_____	_____	LOW
CRUEL	_____	_____	_____	_____	_____	KIND
SUCCESSFUL	_____	_____	_____	_____	_____	UNSUCCESSFUL
GRATEFUL	_____	_____	_____	_____	_____	UNGRATEFUL

Semantic Differential (con't.)

MYSELF AS A PERSON

	very	sort of	neither	sort of	very	
GOOD	_____	_____	_____	_____	_____	BAD
UNFRIENDLY	_____	_____	_____	_____	_____	FRIENDLY
KIND	_____	_____	_____	_____	_____	CRUEL
HONEST	_____	_____	_____	_____	_____	DISHONEST
NEGATIVE	_____	_____	_____	_____	_____	POSITIVE
UNGRATEFUL	_____	_____	_____	_____	_____	GRATEFUL
WILLING	_____	_____	_____	_____	_____	UNWILLING
BEAUTIFUL	_____	_____	_____	_____	_____	UGLY
FOOLISH	_____	_____	_____	_____	_____	WISE
IMPORTANT	_____	_____	_____	_____	_____	UNIMPORTANT
LOW	_____	_____	_____	_____	_____	HIGH
UNSUCCESSFUL	_____	_____	_____	_____	_____	SUCCESSFUL

Semantic Differential (con't.)

TEACHERS

	very	sort of	neither	sort of	very	
UNIMPORTANT	_____	_____	_____	_____	_____	IMPORTANT
WISE	_____	_____	_____	_____	_____	FOOLISH
UGLY	_____	_____	_____	_____	_____	BEAUTIFUL
BAD	_____	_____	_____	_____	_____	GOOD
FRIENDLY	_____	_____	_____	_____	_____	UNFRIENDLY
POSITIVE	_____	_____	_____	_____	_____	NEGATIVE
UNWILLING	_____	_____	_____	_____	_____	WILLING
DISHONEST	_____	_____	_____	_____	_____	HONEST
HIGH	_____	_____	_____	_____	_____	LOW
CRUEL	_____	_____	_____	_____	_____	KIND
SUCCESSFUL	_____	_____	_____	_____	_____	UNSUCCESSFUL
GRATEFUL	_____	_____	_____	_____	_____	UNGRATEFUL

Semantic Differential (con't.)

MYSELF AS A STUDENT

	very	sort of	neither	sort of	very	
UNIMPORTANT	_____	_____	_____	_____	_____	IMPORTANT
WISE	_____	_____	_____	_____	_____	FOOLISH
UGLY	_____	_____	_____	_____	_____	BEAUTIFUL
BAD	_____	_____	_____	_____	_____	GOOD
FRIENDLY	_____	_____	_____	_____	_____	UNFRIENDLY
POSITIVE	_____	_____	_____	_____	_____	NEGATIVE
UNWILLING	_____	_____	_____	_____	_____	WILLING
DISHONEST	_____	_____	_____	_____	_____	HONEST
HIGH	_____	_____	_____	_____	_____	LOW
CRUEL	_____	_____	_____	_____	_____	KIND
SUCCESSFUL	_____	_____	_____	_____	_____	UNSUCCESSFUL
GRATEFUL	_____	_____	_____	_____	_____	UNGRATEFUL

Semantic Differential (con't.)

MY FAMILY

	very	sort of	neither	sort of	very	
GOOD	_____	_____	_____	_____	_____	BAD
UNFRIENDLY	_____	_____	_____	_____	_____	FRIENDLY
KIND	_____	_____	_____	_____	_____	CRUEL
HONEST	_____	_____	_____	_____	_____	DISHONEST
NEGATIVE	_____	_____	_____	_____	_____	POSITIVE
UNGRATEFUL	_____	_____	_____	_____	_____	GRATEFUL
WILLING	_____	_____	_____	_____	_____	UNWILLING
BEAUTIFUL	_____	_____	_____	_____	_____	UGLY
FOOLISH	_____	_____	_____	_____	_____	WISE
IMPORTANT	_____	_____	_____	_____	_____	UNIMPORTANT
LOW	_____	_____	_____	_____	_____	HIGH
UNSUCCESSFUL	_____	_____	_____	_____	_____	SUCCESSFUL

Semantic Differential (con't.)

HOMEWORK

	very	sort of	neither	sort of	very	
UNIMPORTANT	_____	_____	_____	_____	_____	IMPORTANT
WISE	_____	_____	_____	_____	_____	FOOLISH
UGLY	_____	_____	_____	_____	_____	BEAUTIFUL
BAD	_____	_____	_____	_____	_____	GOOD
FRIENDLY	_____	_____	_____	_____	_____	UNFRIENDLY
POSITIVE	_____	_____	_____	_____	_____	NEGATIVE
UNWILLING	_____	_____	_____	_____	_____	WILLING
DISHONEST	_____	_____	_____	_____	_____	HONEST
HIGH	_____	_____	_____	_____	_____	LOW
CRUEL	_____	_____	_____	_____	_____	KIND
SUCCESSFULL	_____	_____	_____	_____	_____	UNSUCCESSFUL
GRATEFUL	_____	_____	_____	_____	_____	UNGRATEFUL

Instructions for Semantic Differential
(To be read orally to students)

In the next few pages you will be asked to express how you feel about a number of things by placing a mark on scales. We want to find out how you really feel about certain people and things by having you put an X between pairs of words, with each pair separated by five blanks. This is not a test. There are no right or wrong answers and no grade will be given. You are to read one scale at a time and then rate it before going on to the next.

Notice the word snow. Then see the words unpleasant and pleasant. There are five blanks and five words between the words unpleasant and pleasant. You can show us how you feel about snow by putting an X in one of the five blanks between the words unpleasant and pleasant. Notice the words above the blanks--very, sort of, neither, sort of, very. If you think that snow is very unpleasant, put an X in the blank under the word very next to the word unpleasant. If you feel that snow is sort of unpleasant, put an X under the words sort of closest to the word unpleasant. If you feel that snow is neither pleasant nor unpleasant, put an X under the word neither to show that it is just as pleasant as it is unpleasant, or that it is just as unpleasant as it is pleasant. If you feel that snow is sort of pleasant, put an X under the words sort of closest to the word pleasant. If you feel that snow is very pleasant, put an X under the word very next to the word pleasant. Have you put one X in the blank of your choice to show how unpleasant or how pleasant you think snow is?

Now you have marked one scale about snow. Let's mark another one. Notice the words good and bad. Put an X in one of the blanks between these two words to show how good or how bad you think snow is. (Discussion)

On each page that follows you will be asked to mark several scales about the word or words at the top of the page. You may feel that some pairs of words (or scales) don't exactly go with the word at the top of the page. We want you to use each scale, however; so use your imagination and put an X between each pair of words to express your feelings about the word at the top of the page. Do not forget to mark any scale. Mark each one on each page.

Do not skip any scale. Mark each one in order. Do not turn back to any page you have already finished. You can work quickly because there are no right or wrong answers. Mark your first feelings as you come to each scale; then proceed to the next one.

Are there any questions? . . . Then please turn to the first scale. Read silently while I read aloud the words in the left-hand column. (Read aloud all the words in the left column.) Now read silently while I read aloud the words in the right-hand column. (Read aloud all the words in the right column.) Finally, let's look at the word or phrase printed at the top of each page. You read silently while I read aloud. (Read aloud the word at the top of

each page .) If you do not recognize a word while you are working on this questionnaire, raise your hand and someone will co e to help you.

Now let's turn back to the first scale and begin filling in your responses. Work quickly but carefully.

Example on students' sheet:

SNOW

	very	sort of	neither	sort of	very	
UNPLEASANT	_____	_____	_____	_____	_____	PLEASANT
GOOD	_____	_____	_____	_____	_____	BAD

Appendix H, Something About Myself, (pages 119-121) has been removed at the request of the copyright holder. The test is available from:

Stoelting Company
1350 South Kostner Avenue
Chicago, Illinois 60623
(Area Code 312) 522-4500

Appendix I

Complete Test Battery

Cognitive Tests

IQ	Kuhlmann-Anderson Test
CAVERBAL	Cognitive Abilities Test: Verbal Battery
CAQUANT	Cognitive Abilities Test: Quantitative Battery
CANON	Cognitive Abilities Test: Nonverbal Battery
SRAR	SRA Achievement Series: Reading
SRAV	SRA Achievement Series: Vocabulary
SRAMCON	SRA Achievement Series: Mathematics Concepts
SRAMCOM	SRA Achievement Series: Mathematics Computation
SRALA	SRA Achievement Series: Language Arts
SRAS	SRA Achievement Series: Spelling

Affective Tests

CPSR	California Test of Personality: Self-Reliance
CPTA	California Test of Personality: Total Adjustment
N-S	Nowicki-Strickland Scale
SDMS	Semantic Differential: My School
SDMAS	Semantic Differential: Math and Science Activities
SDMH	Semantic Differential: My Home
SDRL	Semantic Differential: Reading and Language Arts (English Activities)
SDGR	Semantic Differential: Grown-Ups

SDCL	Semantic Differential: My Classmates
SDAM	Semantic Differential: Art and Music Activities
SDMAP	Semantic Differential: Myself as a Person
SDTE	Semantic Differential: Teachers
SDMYS	Semantic Differential: Myself as a Student
SDMYF	Semantic Differential: My Family
SDHO	Semantic Differential: Homework
SSSCOMP	Self-Social Symbols Tasks: Complexity
SSSCENT	Self-Social Symbols Tasks: Centrality
SSSDEP	Self-Social Symbols Tasks: Dependency
SSSG	Self-Social Symbols Tasks: Grouping
SSSIT	Self-Social Symbols Tasks: Identification Teacher
SSSIF	Self-Social Symbols Tasks: Identification Friend
O-I	Onomatopoeia and Images
SAMT	Something About Myself: Total
SAMES	Something About Myself: Environmental Sensitivity
SAMIN	Something About Myself: Initiative
SAMSS	Something About Myself: Self-Strength
SAMINT	Something About Myself: Intellectuality
SAMIND	Something About Myself: Individuality
SAMART	Something About Myself: Artistry

Appendix J

Numbers of the Hypotheses Related to Each Variable

IQ	1	32	63	94	133	172	211	242	273	304	335	366	397
CAVERBAL	2	33	64	95	134	173	212	243	274	305	336	367	398
CAQUANT	3	34	65	96	135	174	213	244	275	306	337	368	399
CANON	4	35	66	97	136	175	214	245	276	307	338	369	400
SRAR	5	36	67	98	137	176	215	246	277	308	339	370	401
SRAV	6	37	68	99	138	177	216	247	278	309	340	371	402
SRAMCON	7	38	69	100	139	178	217	248	279	310	341	372	403
SRAMCOM	8	39	70	101	140	179	218	249	280	311	342	373	404
SRALA	9	40	71	102	141	180	219	250	281	312	343	374	405
SRAS	10	41	72	103	142	181	220	251	282	313	344	375	406
CPSR	11	42	73	104	143	182	221	252	283	314	345	376	407
CPTA	12	43	74	105	144	183	222	253	284	315	346	377	408
N-S	13	44	75	106	145	184	223	254	285	316	347	378	409
SDMS	14	45	76	107	146	185	224	255	286	317	348	379	410
SDMAS	15	46	77	108	147	186	225	256	287	318	349	380	411
SDMH	16	47	78	109	148	187	226	257	288	319	350	381	412
SDRL	17	48	79	110	149	188	227	258	289	320	351	382	413
SDGR	18	49	80	111	150	189	228	259	290	321	352	383	414
SDCL	19	50	81	112	151	190	229	260	291	322	353	384	415
SDAM	20	51	82	113	152	191	230	261	292	323	354	385	416
SDMAP	21	52	83	114	153	192	231	262	293	324	355	386	417
SDTE	22	53	84	115	154	193	232	263	294	325	356	387	418

124

SDMYS	23	54	85	116	155	194	233	264	295	326	357	388	419
SDMYF	24	55	86	117	156	195	234	265	296	327	358	389	420
SDHO	25	56	87	118	157	196	235	266	297	328	359	390	421
SSSCOMP	26	57	88	119	158	197	236	267	298	329	360	391	422
SSSCENT	27	58	89	120	159	198	237	268	299	330	361	392	423
SSSDEP	28	59	90	121	160	199	238	269	300	331	362	393	424
SSSG	29	60	91	122	161	200	239	270	301	332	363	394	425
SSSIT	30	61	92	123	162	201	240	271	302	333	364	395	426
SSSIF	31	62	93	124	163	202	241	272	303	334	365	396	427
O-I				125	164	203							
SAMT				126	165	204							
SAMES				127	166	205							
SAMIN				128	167	206							
SAMSS				129	168	207							
SAMINT				130	169	208							
SAMIND				131	170	209							
SAMART				132	171	210							

125

Appendix K

Summary of Significant Main Effects and Significant Interactions Among Treatment Groups, Intelligence Levels, and Socio-Economic Levels for Experimental Group vs. Control Groups A, B, and C--Fall and Spring Testing

Variable	Exp. vs. Con. A		Exp. vs. Con. B		Exp. vs. Con. C	
	Fall	Spring	Fall	Spring	Fall	Spring
IQ[a]	ns	ns	ns	ns	ns	ns
CAVERBAL[b]	ns	ns	ns	Exp.**	ns	ns
CAQUANT[c]	ns	ns	ns	ns	SES*	ns
CANON[d]	ns	ns	ns	ns	Exp.*	ns
SRAR[e]	ns	ns	ns	ns	ns	Exp.*
SRAV[f]	ns	ns	ns	ns	ns	Exp.*
SRAMCON[g]	ns	ns	Exp.*	ns	ns	SES*
SRAMCOM[h]	ns	ns	ns	ns	ns	ns
SRALA[i]	ns	ns	ns	ns	ns	ns
SRAS[j]	ns	ns	ns	ns	ns	ns
CPSR[k]	ns	ns	ns	GxSES*	ns	ns
CPTA[l]	ns	ns	GxSES**	GxSES*	GxIQ*	GxIQ*
N-S[m]	GxSES*	GxSES*	GxSES**	GxSES*	ns	GxIQ*
SDMS[n]	ns	ns	GxIQ*	ns	GxIQ*	ns
SDMAS[o]	ns	ns	ns	GxIQ*	ns	ns
SDMH[p]	ns	GxIQ*	ns	GxIQ*	GxSES*	GxSES** GxIQ**

126

Appendix K (con't.)

Variable	Exp. vs. Con. A Fall	Exp. vs. Con. A Spring	Exp. vs. Con. B Fall	Exp. vs. Con. B Spring	Exp. vs. Con. C Fall	Exp. vs. Con. C Spring
SDRL[q]	ns	ns	ns	ns	ns	ns
SDGR[r]	ns	ns	GxIQ*	GxIQ*	GxIQ*	GxSES* GxIQ**
SDCL[s]	ns	ns	ns	ns	ns	ns
SDAM[t]	Con.*	GxIQ**	Con.**	GxIQ*	Con.*	GxIQ*
SDMAP[u]	ns	ns	ns	ns	GxSES*	ns
SDTE[v]	Con.*	ns	ns	ns	Con.*	ns
SDMYS[w]	Con.*	ns	Con.*	Con.*	GxSES*	ns
SDMYF[x]	GxIQ*	GxIQ*	GxIQ*	GxIQ*	ns	ns
SDHO[y]	ns	ns	ns	ns	ns	ns
SSSCOMP[z]	ns	GxSES*	ns	ns	ns	GxSES*
SSSCENT[aa]	ns	ns	Exp.*	ns	ns	Con.*
SSSDEP[bb]	ns	ns	GxSES*	ns	ns	GxIQ*
SSSG[cc]	ns	ns	GxIQ*	ns	GxIQ**	ns
SSSIT[dd]	ns	ns	ns	ns	ns	ns
SSSIF[ee]	ns	ns	ns	ns	ns	ns
O-I[ff]		ns		ns		ns
SAMT[gg]		ns		ns		ns
SAMES[hh]		GxIQ*		GxIQ*		GxSES*
SAMIN[ii]		ns		ns		ns

127

Appendix K (con't.)

Variable	Exp. vs. Con. A Fall	Exp. vs. Con. A Spring	Exp. vs. Con. B Fall	Exp. vs. Con. B Spring	Exp. vs. Con. C Fall	Exp. vs. Con. C Spring
SAMSS[jj]	ns		ns		ns	
SAMINT[kk]	Exp.*		ns		GxSES**	
SAMIND[ll]	ns		ns		ns	
SAMART[mm]	ns		ns		ns	

*$p < .05$

**$p < .01$

Note. Exp. indicates that Experimental pupils scored significantly higher than a given control group.
Con. indicates that pupils in a given control group scored significantly higher than the Experimental pupils.
GxIQ indicates a significant interaction between treatment groups and intelligence levels.
GxSES indicates a significant interaction between treatment groups and socio-economic levels.

The tests...

[a]Kuhlmann-Anderson Test

[b]Cognitive Abilities Test: Verbal Battery

[c]Cognitive Abilities Test: Quantitative Battery

[d]Cognitive Abilities Test: Nonverbal Battery

[e]SRA Achievement Series: Reading

[f]SRA Achievement Series: Vocabulary

[g]SRA Achievement Series: Mathematics Concepts

[h]SRA Achievement Series: Mathematics Computations

[i] SRA Achievement Series: Language Arts

[j] SRA Achievement Series: Spelling

[k] California Test of Personality: Self-Reliance

[l] California Test of Personality: Total Adjustment

[m] Nowicki-Strickland Scale

[n] Semantic Differential: My School

[o] Semantic Differential: Math and Science Activities

[p] Semantic Differential: My Home

[q] Semantic Differential: Reading and Language Arts (English Activities)

[r] Semantic Differential: Grown-Ups

[s] Semantic Differential: My Classmates

[t] Semantic Differential: Art and Music Activities

[u] Semantic Differential: Myself as a Person

[v] Semantic Differential: Teachers

[w] Semantic Differential: Myself as a Student

[x] Semantic Differential: My Family

[y] Semantic Differential: Homework

[z] Self-Social Symbols Tasks: Complexity

[aa] Self-Social Symbols Tasks: Centrality

[bb] Self-Social Symbols Tasks: Dependency

[cc] Self-Social Symbols Tasks: Grouping

[dd] Self-Social Symbols Tasks: Identification Teacher

[ee] Self-Social Symbols Tasks: Identification Friend

ff Onomatopoeia and Images

gg Something About Myself: Total

hh Something About Myself: Environmental Sensitivity

ii Something About Myself: Initiative

jj Something About Myself: Self-Strength

kk Something About Myself: Intellectuality

ll Something About Myself: Individuality

mm Something About Myself: Artistry

130

Appendix L

Summary of Significant Gain Scores
Between Fall and Spring Testing for the
Experimental Group and Control Groups A, B, and C

Variable	Exp.	Con. A	Con. B	Con. C
IQ[a]	51.04** (+)	38.18** (+)	146.34** (+)	36.31** (+)
CAVERBAL[b]	86.18** (+)	108.48** (+)	90.25** (+)	75.61** (+)
CAQUANT[c]	26.20** (+)	16.99** (+)	47.64** (+)	49.03** (+)
CANON[d]	23.17** (+)	13.71** (+)	35.89** (+)	45.79** (+)
SRAR[e]	24.35** (+)	8.90** (+)	18.19** (+)	17.15** (+)
SRAV[f]	28.12** (+)	5.06* (+)	28.16** (+)	15.17** (+)
SRAMCON[g]	10.36** (+)	16.10** (+)	32.77** (+)	4.45* (+)
SRAMCOM[h]	31.54** (+)	57.48** (+)	126.54** (+)	95.22** (+)
SRALA[i]	1.98	3.35	24.99** (+)	12.26** (+)
SRAS[j]	35.69** (+)	12.86** (+)	24.48** (+)	15.92** (+)
CPSR[k]	.05	2.10	.02	.55
CPTA[l]	2.86	.11	2.50	.05
N-S[m]	5.59* (-)	18.29** (-)	20.42** (-)	19.28** (-)
SDMS[n]	10.41** (-)	4.28* (-)	1.72	1.95
SDMAS[o]	28.02** (-)	1.13	1.31	4.53* (-)
SDMH[p]	1.51	3.10	4.46* (-)	.89
SDRL[q]	6.04* (-)	2.88	6.30** (-)	1.19
SDGR[r]	17.75** (-)	3.86	7.57** (-)	9.49** (-)

Appendix L (con't.)

Variable	Exp.	Con. A	Con. B	Con. C
SDCL[s]	1.57	.04	.55	.34
SDAM[t]	.60	2.64	7.33** (-)	14.85** (-)
SDMAP[u]	1.12	2.11	3.04	3.26
SDTE[v]	8.56** (-)	12.88** (-)	8.54** (-)	8.44** (-)
SDMYS[w]	4.45* (-)	.72	3.30	1.22
SDMYF[x]	1.46	2.99	1.90	.54
SDHO[y]	17.42** (-)	13.73** (-)	28.49** (-)	9.27** (-)
SSSCOMP[z]	1.66	2.12	4.24* (+)	1.24
SSSCENT[aa]	4.16* (-)	.67	.02	.28
SSSDEP[bb]	5.63* (+)	2.16	17.94** (+)	15.68** (+)
SSSG[cc]	2.71	1.70	.55	.14
SSSIT[dd]	6.10* (-)	.53	.06	.50
SSSIF[ee]	.18	1.41	.50	3.78

* $p < .05$

** $p < .01$

Note. (+) Indicates an increase in gain scores.
(-) Indicates a decrease in gain scores.

The tests...

[a] Kuhlmann-Anderson Test

[b] Cognitive Abilities Test: Verbal Battery

[c] Cognitive Abilities Test: Quantitative Battery

[d] Cognitive Abilities Test: Nonverbal Battery

[e] SRA Achievement Series: Reading

[f] SRA Achievement Series: Vocabulary

[g] SRA Achievement Series: Mathematics Concepts

[h] SRA Achievement Series: Mathematics Computations

[i] SRA Achievement Series: Language Arts

[j] SRA Achievement Series: Spelling

[k] California Test of Personality: Self-Reliance

[l] California Test of Personality: Total Adjustment

[m] Nowicki-Strickland Scale

[n] Semantic Differential: My School

[o] Semantic Differential: Math and Science Activities

[p] Semantic Differential: My Home

[q] Semantic Differential: Reading and Language Arts (English Activities)

[r] Semantic Differential: Grown-Ups

[s] Semantic Differential: My Classmates

[t] Semantic Differential: Art and Music Activities

[u] Semantic Differential: Myself as a Person

[v] Semantic Differential: Teachers

[w] Semantic Differential: Myself as a Student

Appendix L (con't.)

[x] Semantic Differential: My Family

[y] Semantic Differential: Homework

[z] Self-Social Symbols Tasks: Complexity

[aa] Self-Social Symbols Tasks: Centrality

[bb] Self-Social Symbols Tasks: Dependency

[cc] Self-Social Symbols Tasks: Grouping

[dd] Self-Social Symbols Tasks: Identification Teacher

[ee] Self-Social Symbols Tasks: Identification Friend